

IoT FACT SHEET

Powerful, Proven Protection for the Internet of Things

By 2025, there will be 41.6 billion connected devices according to IDC. This includes everything from smartphones to pacemakers, cars to oil platforms. Based on electronics, the one thing these all have in common is the need to withstand the demands of challenging environmental conditions. Together, these devices constitute the Internet of Things (IoT), a collective presence that is dramatically changing our world.

Among the industry, individual segments are bursting with exponential growth:

- By the year 2022, revenue generated by consumer electronics will spike to \$180 billion.¹
- 145.04 million utility connections will be established by 2025.²



CHALLENGES

IoT devices serve purposes of all types, so the environments where they operate are just as diverse. Printed circuit boards (PCBs), semiconductors, and other electrical components are powering the IoT and require durable protection against water, extreme temperatures, humidity, chlorinated liquids, beverages, corrosive substances and more. When an IoT device succumbs to environmental threats, manufacturers face product returns, warranty claims, and expensive repairs. In our connected world, this is a best-case scenario. If a mission-critical device fails, lives are jeopardized, often with catastrophic results.

Finding a solution that can protect the circuitry inside IoT devices is a challenge for industry stakeholders. Growing consumer expectations, such as pressure to expand product lifespans, are an issue. IoT appliances are expected to remain in service for up to 10 years longer than a typical computing device. Consumers are also requiring extended reliability and robustness from the first date of use.

SOLUTION

To function in various environments, everything from IoT sensors and actuators, to smartphones and 5G repeaters, and the circuitry powering them must have extended protection. Traditionally OEMs have used conformal coatings to safeguard PCBs, sensors, and associated parts from environmental contamination.

Unfortunately, traditional conformal coatings such as silicones, acrylics, or epoxies don't measure up when it comes to performance and protection. They are thick and bulky, and can form an uneven coating. The voids, pools, and cracks in these coatings can result in device failure after a short circuit that begins immediately after water ingress or corrosive damage that quietly obliterates devices.

OEMs, however, have a better solution when it comes to protecting IoT devices. Thin-film nano coatings, based on material science including Parylene and plasma-based derivatives. These next generation solutions provide superior protection, tailored to the specific operating environments, at a price point competitive with legacy alternatives.



BENEFITS

What OEMs Need to Know About Parylene and Plasma-Based Nano Coatings

FACT	BENEFIT
Both Parylene and plasma-based nano coatings are applied using a process called “chemical vapor deposition” or CVD. CVD delivers the consistency, quality, and repeatability required in IoT manufacturing.	One hundred twenty-seven new IoT devices are connecting to the web every second. ³ CVD affords manufacturers the ability to increase throughput and decrease cycle times.
Parylene and plasma-based nano coatings are applied as super-thin conformal coatings (less than a fraction of a human hair) to protect IoT electronic components. This thinness allows manufacturers to avert unnecessary weight and bulk during device design.	IoT devices are growing smaller and more complex. For example, the Apple Watch measures in at 38.6m x 33.3mm, with a depth of 11.4 and a weight of 28.2 grams ⁴ . IoT OEMs can pack a lot of functionality into these small devices when their protective coating is so thin.
Parylene protection can make a device utterly impervious to liquid and corrosion damage, while Plasma-based nano coatings offer durable protection at a competitive price point, with an appropriate level of protection for non-mission-critical device components.	IoT devices must function anywhere, contingent upon hardware reliability. ⁵ Sensors may be located in the home, factory city, on the human body, or elsewhere. Thin-film coatings and nano coatings protect against diverse environmental threats that devices may face.
Parylene thin-film coatings offer superior corrosion resistance. They are insoluble in all solvents up to 150° Celsius.	Parylene can prevent unnecessary warranty claims and repairs, eliminating costs, and improving the consumer experience. Able to stand the test of time, Parylene helps ensure your brand and business are always covered.
With plasma-based nano coatings, masking can be minimized taking out cost, driving throughput, and improving yield.	The global IoT market will reach \$45.3 billion by 2022. ⁶ In this competitive marketplace, obtaining faster production times while cutting labor by as much as 80% is critical.

¹ Statista, ² Etno, ³ Leftronic, ⁴ Apple, ⁵ IOSPress, ⁶ Markets and Markets



**HZO CAN PREVENT
UNNECESSARY WARRANTY
CLAIMS AND REPAIRS,
ELIMINATING COSTS,
AND IMPROVING THE
CUSTOMER EXPERIENCE.**

WHY HZO

- We are the only industry vendor to offer a Spectrum of Protection™, a portfolio of unique thin-film and nano coatings composed of materials aligned to an OEM’s specific needs. Drawing upon our wide selection of complex chemical compositions, we meet protection requirements, design parameters, sustainability requirements, cost consideration, and market consideration.
- Our deposition chambers are the largest in the industry, increasing efficiency, and throughput. Up to 50% more units per hour can typically be coated.
- We offer coating as a service, in your location, or ours, drawing from an intellectual property and patent portfolio of over 370 assets.
- Our engineers have practical industry expertise and are ready to offer insight, delivering you a prescriptive, customized plan for a reliable protection solution.
- We bring the right people, processes, material science, and equipment together to deliver an optimized turnkey solution.
- We ensure results, deliver the industry’s highest yields, and drive down costs at every stage of the protection process.
- Fortune 100 brands work with and trust HZO to deliver reliable, repeatable results.



WHEN IT COMES TO COATINGS, WE’VE GOT YOU COVERED!

Let us know how we can help at [HZO.COM/CONTACT-US](https://www.hzo.com/contact-us) OR 1-877-757-4HZO (4496)