



## CONSUMER ELECTRONICS FACT SHEET

# The Most Durable, Reliable Water Protection for Consumer Electronics

The consumer electronics marketplace is experiencing prolific growth, expected to reach approximately USD 1.787 trillion in 2024, growing at a CAGR of slightly above 6.0% between 2018 and 2024.<sup>1</sup>

Factors driving this growth include the proliferation of the Internet of Things devices (smartphones, Bluetooth speakers, earphones), miniaturization of electronics, and increasing discretionary spending. As a result, consumers have demonstrated an appetite to maintain multiple devices.<sup>2</sup>

- Deloitte estimates the combined smartphone and smartphone multiplier market to be worth \$944 billion in 2020.<sup>3</sup>
- Smartphone repairs are a \$12 billion industry and smartphone insurance is also \$12 billion.<sup>4</sup>
- The Bluetooth speaker market was valued at USD 6.49 billion in 2019, and it is expected to reach USD 48.52 billion by 2025.<sup>5</sup>

Because of the ability to use electronics on the go, consumers want to take them anywhere. Durable, waterproofed devices are no longer “nice features” for an OEM to offer; it’s a requirement.



## CHALLENGES

Waterproofing is a mandate to meet consumer expectations. Yet, products easily damaged by liquids are still common standards. For example, in 2018, 65% of users reported that they had experienced smartphone damage as a result of water exposure.<sup>6</sup>

Liquid protection is the second most demanded feature in consumer electronics, right behind battery life. However, with devices getting smaller and more complex, OEMs are challenged to keep pace with market expectations for protection. Traditional methods of waterproofing such as mechanical seals are bulky, add weight, and can break down over time. When devices get damaged from liquid exposure, OEMs pay. In 2017, electronics manufacturers paid out nearly \$9.55 billion in claims, many of which were due to liquid damage.<sup>7</sup>

## SOLUTION

Mechanical seals and enclosures that attempt to prevent water from seeping into electronics do not hold up well over time, can break with regular usage, and cosmetically can detract from the product. Conformal coatings, polymeric materials that are applied directly to electronic circuitry are a superior waterproofing method that protects from the inside out, making liquid ingress a non-issue.

However, many traditional conformal coatings (acrylics, silicones, and epoxies) must be applied using a liquid application, which makes repeatability and reliability difficult. Common issues with liquid, non-automated application methods include uneven coating, along with voids, cracks, and pools that break the airtight seal, rendering the protective layer useless.

When it comes to satisfying consumer demand for waterproofed devices, traditional conformal coatings are a step in the right direction. But, Parylene thin-film coatings and plasma-polymerized nano coatings are the ideal protection solution.



# BENEFITS

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

FACT	BENEFIT
Both Parylene and plasma-polymerized nano coatings are applied using a process called "chemical vapor deposition" or CVD. CVD delivers consistency and quality necessary to produce unparalleled protection.	CVD provides a more prescriptive approach yielding better uniformity, predictability, and protection.
Parylene and plasma-based nano coatings are applied as ultra-thin conformal coatings (less than a fraction of a human hair) to protect consumer electronic components. This thinness allows manufacturers to avert unnecessary weight and bulk during device design.	Consumer devices are following the trajectory of Moore's Law, growing in complexity while shrinking in size and stature. Thin-films support the miniaturization of consumer electronics.
Traditional conformal coatings require a process called curing to harden the films. After this process, a residual solvent is left behind that can harm the environment.	Parylene and plasma-polymerized nano coatings do not require curing. Solvent emissions can be eliminated, and workforce health improved. Energy bills can be substantially reduced.
Parylene protection can make a device impervious to liquid and corrosion damage, while Plasma-polymerized nano coatings offer reasonable protection at a competitive price point.	For consumers, water damage is top of mind. Within the computers and electronics category of searches on Google Trends, searches for "water damage warranty" are currently at a peak. Ruggedized protection can satisfy the demand for true water-resistance.
With plasma-polymerized nano coatings, minimal prep (i.e., masking) is often required, taking out cost, driving throughput, and improving yield.	Faster production times are possible, and labor can be cut down by as much as 80% when masking is reduced or eliminated.
Parylene is a durable coating, forming a permanent bond with any surface it adheres. Additionally, it has a lifespan that can extend beyond 20 years.	Parylene protection can produce products that are more robust and longer-lasting. Extended shelf-life increases satisfaction and result in customer loyalty.

<sup>1</sup> GlobeNewsWire, <sup>2</sup> PR Newswire, <sup>3,4</sup> Statista, <sup>5</sup> Mordor Intelligence, <sup>6</sup> Statista, <sup>7</sup> Warranty Week



**WE GUARANTEE RESULTS,  
DELIVER THE INDUSTRY'S  
HIGHEST YIELDS, AND  
DRIVE DOWN COST AT  
EVERY STAGE OF THE  
PROTECTION PROCESS.**

## 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)