



Protection from the Inside Out™

organized by

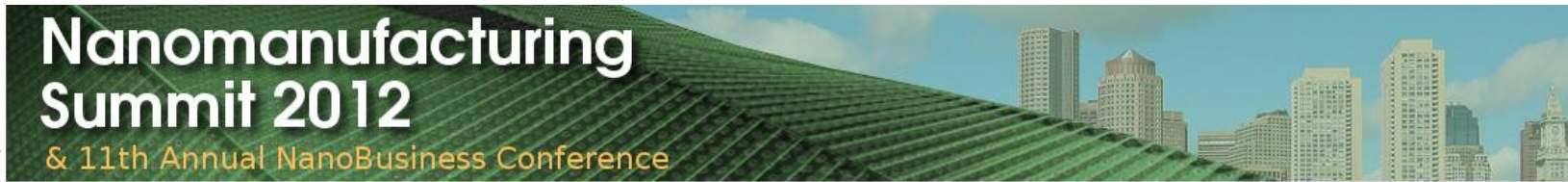


NanoBusiness
COMMERCIALIZATION ASSOCIATION

**National
Nanomanufacturing
Network**

Nanomanufacturing Summit 2012

& 11th Annual NanoBusiness Conference



H₂O Paradigm Shift



H₂O will change where and how computing is used.

H₂O will remove the fear that electronics will be destroyed when exposed to or submersed in water.

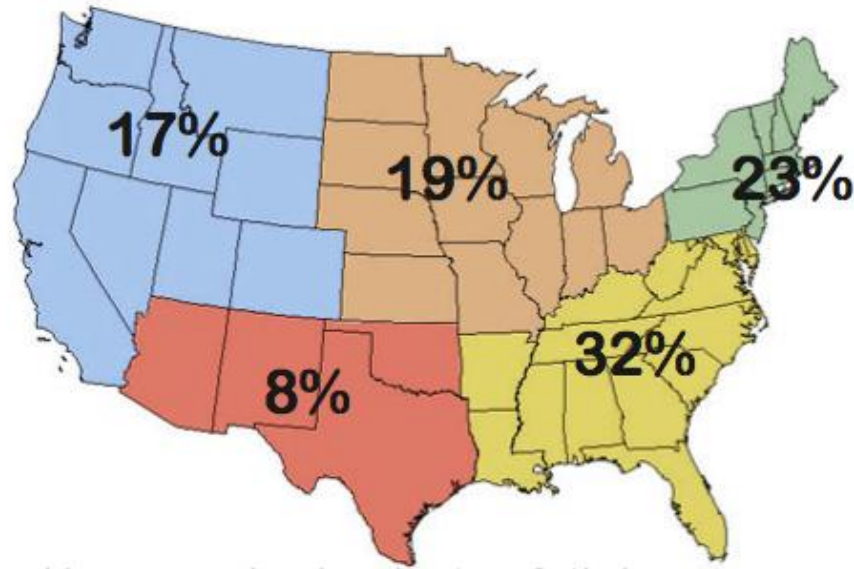




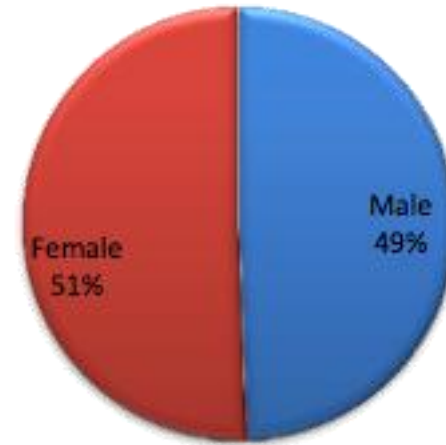




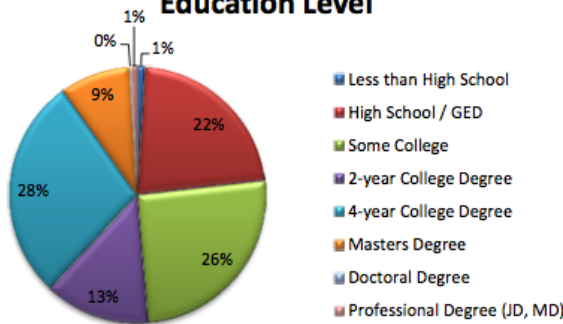
H2O Market Research Survey



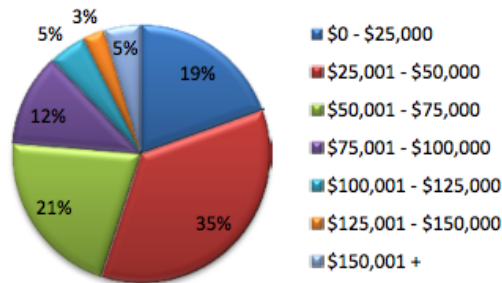
Gender



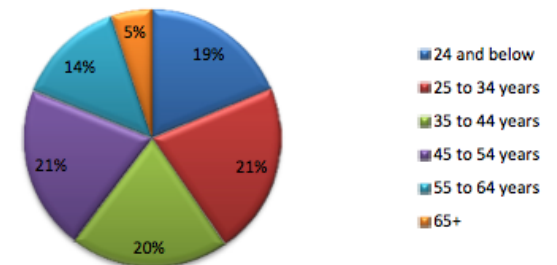
Education Level



Income



Age

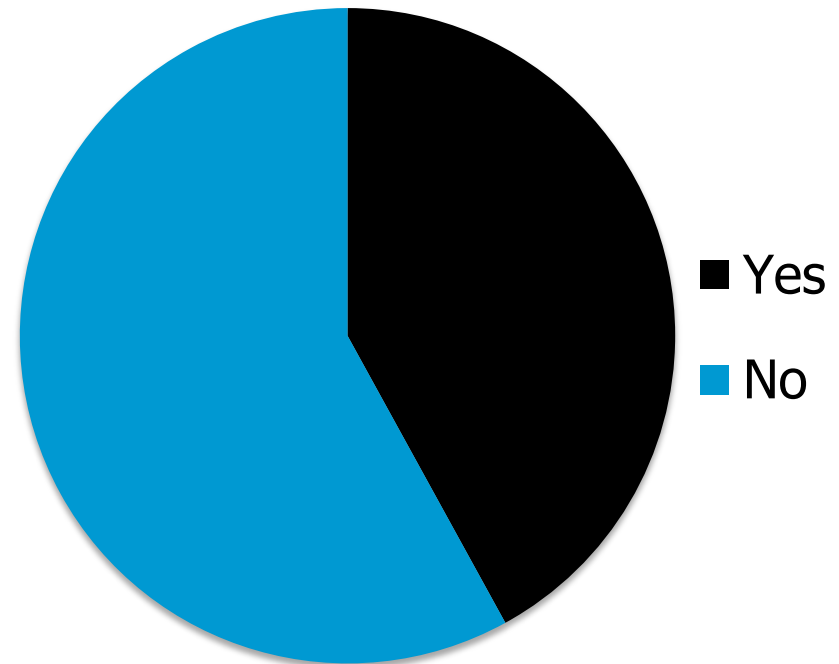


HzO Market Research Survey



"Have you had a device fail due to water damage?"

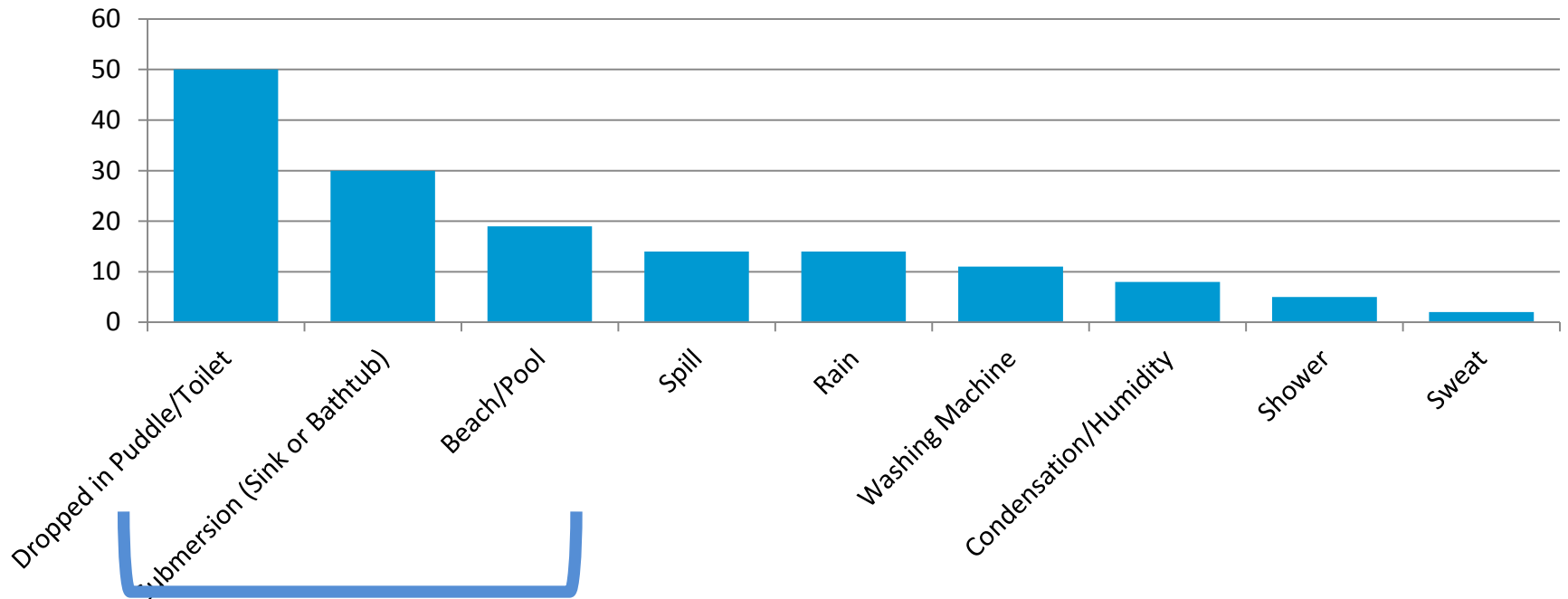
42% of respondents had experienced electronic device failure due to moisture



H2O Market Research Survey



Cause of Failure



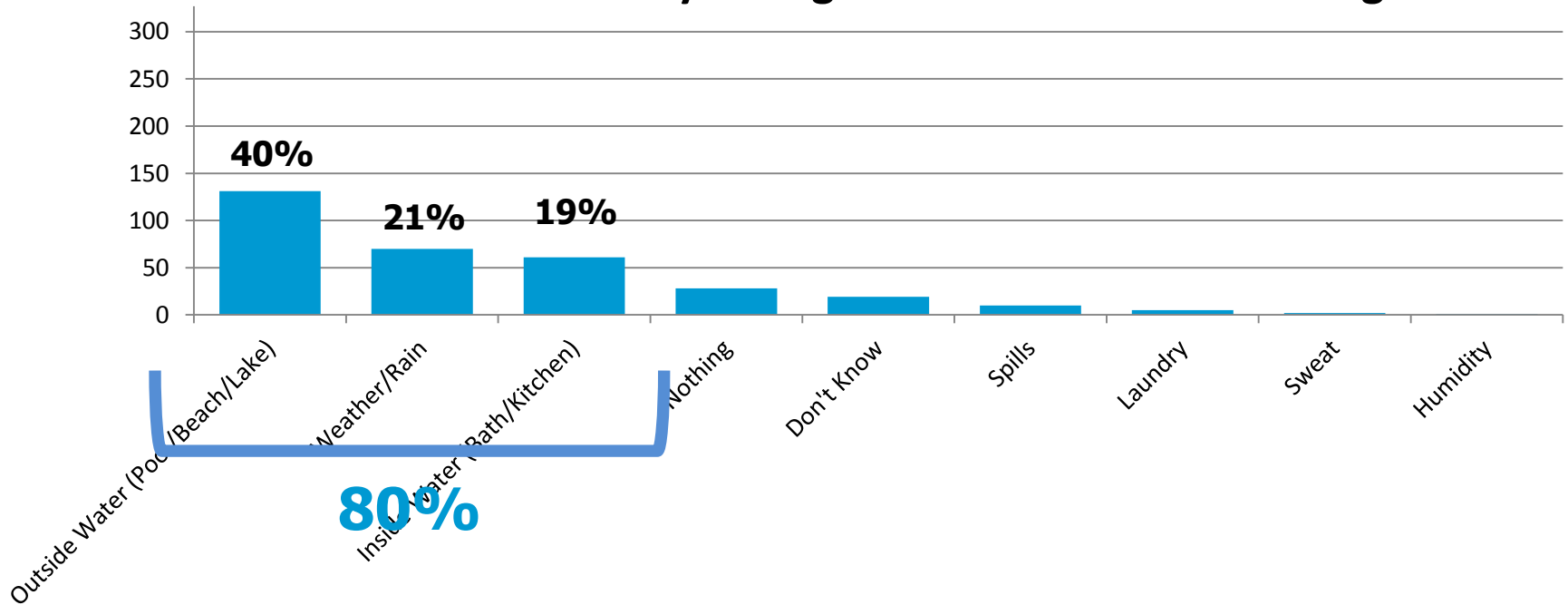
**Submersion
Related**



H2O Market Research Survey



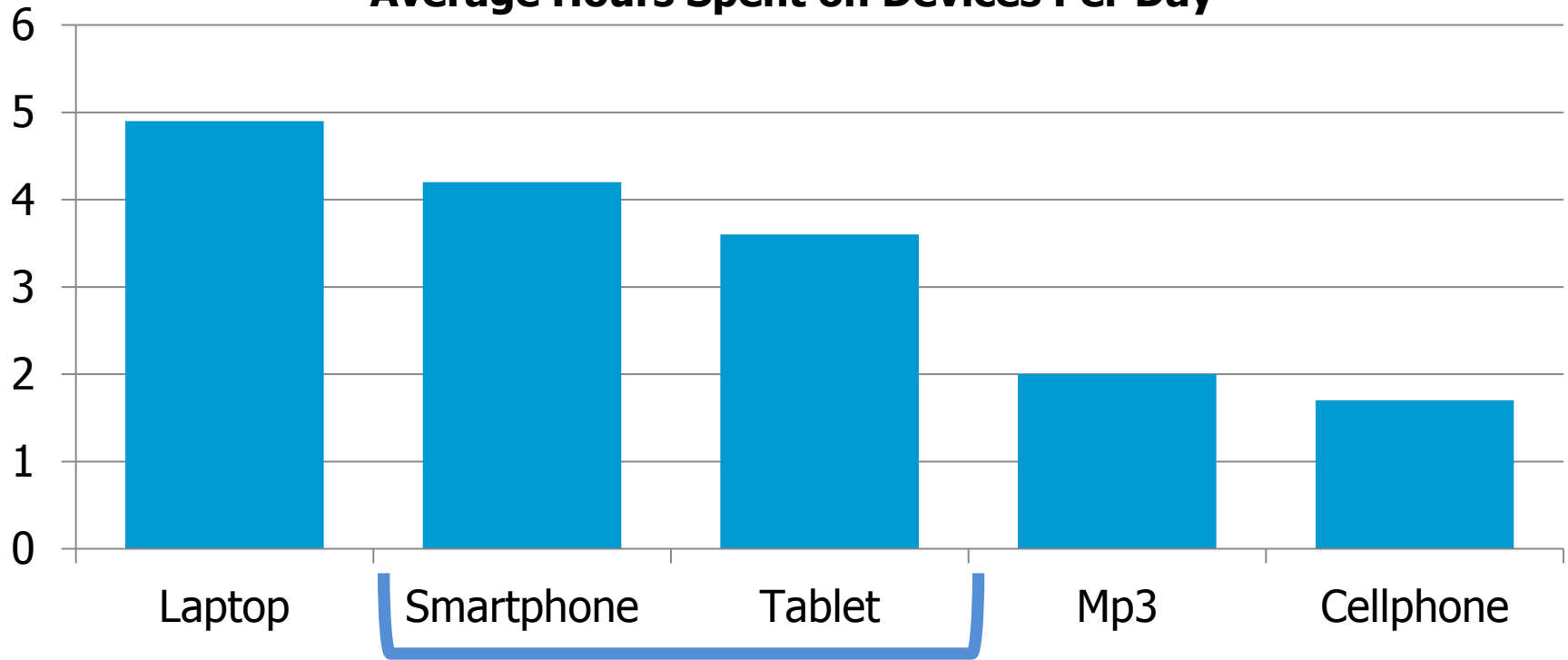
“What activities are you at greatest risk of water damage?”



HzO Market Research Survey



"Average Hours Spent on Devices Per Day"



**High Growth
Categories**





**When it comes to
losing your devices in
the toilet, we're all
children.**









DEMO





What is WaterBlock™?

What is HzO WaterBlock?

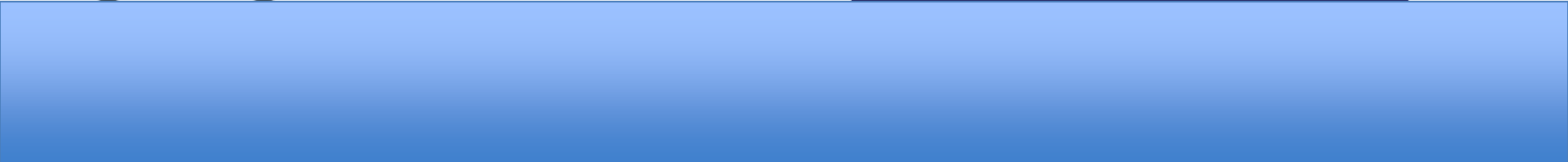
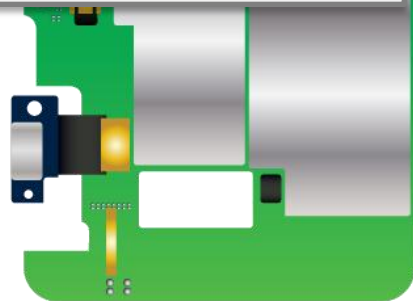
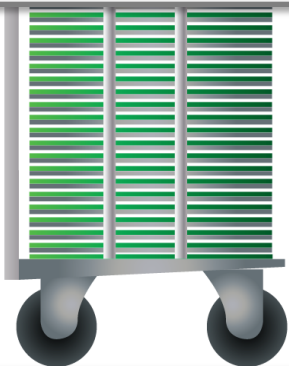
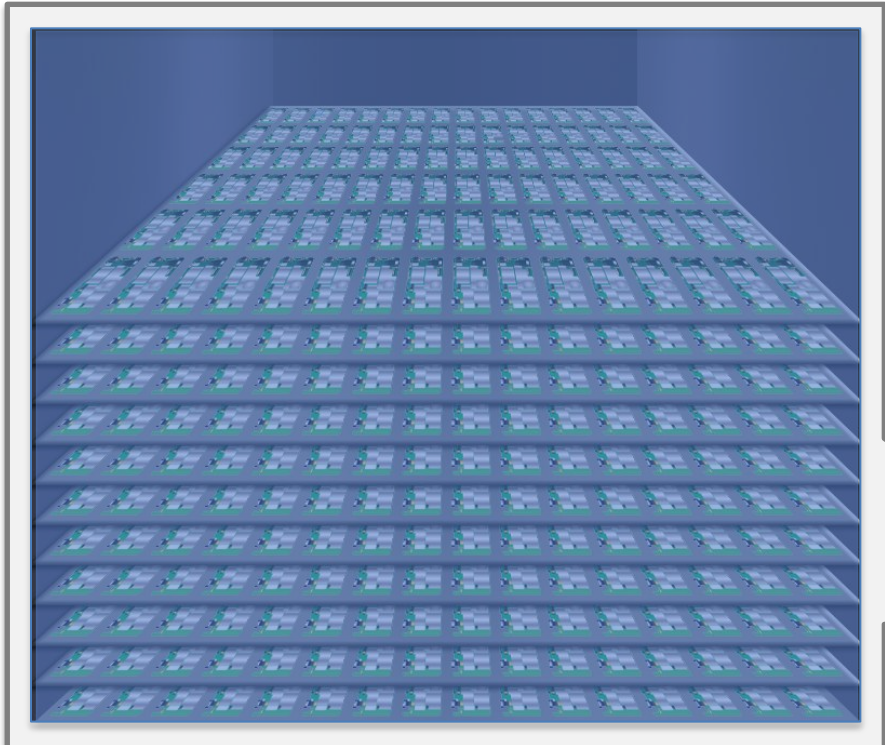


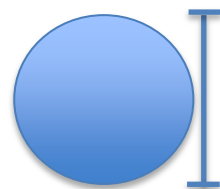
WaterBlock is a thin film nano-coating that is applied at the manufacturing level to the inside electronic assemblies and components of a device.

It is used to protect devices from:

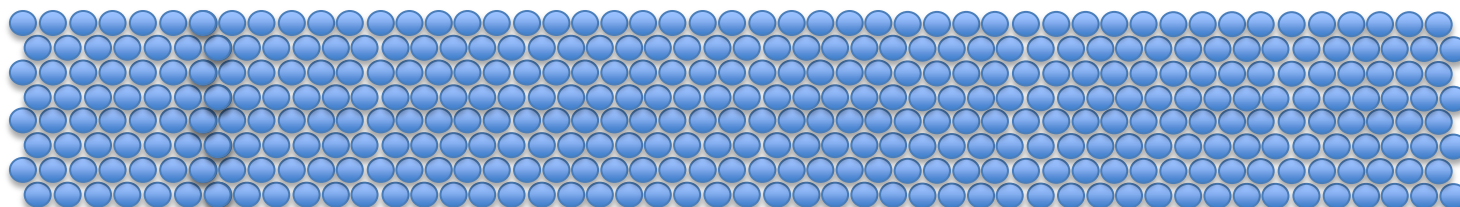
- Water
- Moisture
- Small particles and debris



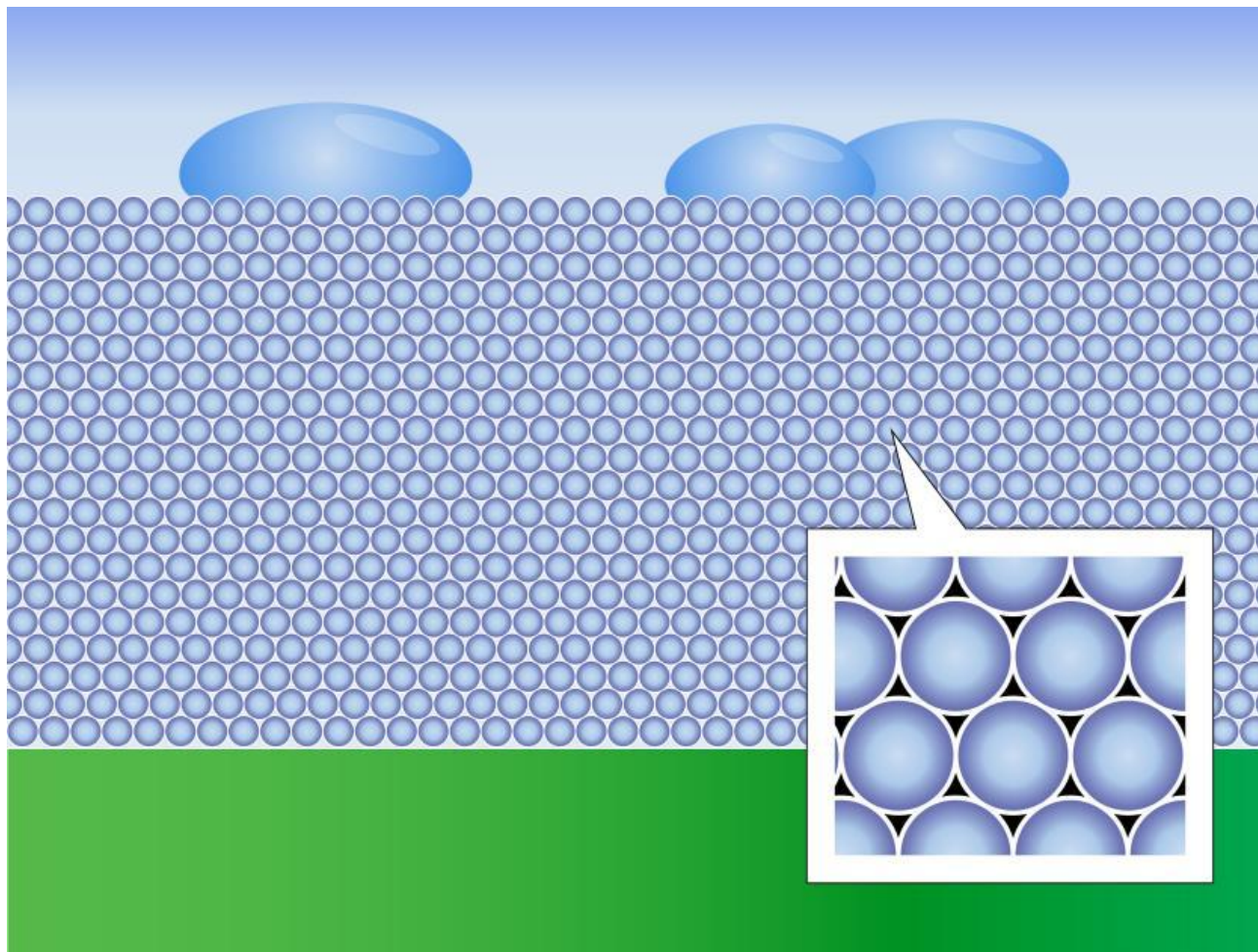




= Angstrom size Particles



3-7 Microns



- WaterBlock™ coating is a uniform film with bonded particles
- WaterBlock™ formation occurs on the surface, not above the surface resulting in a smooth, uniform application of the coating



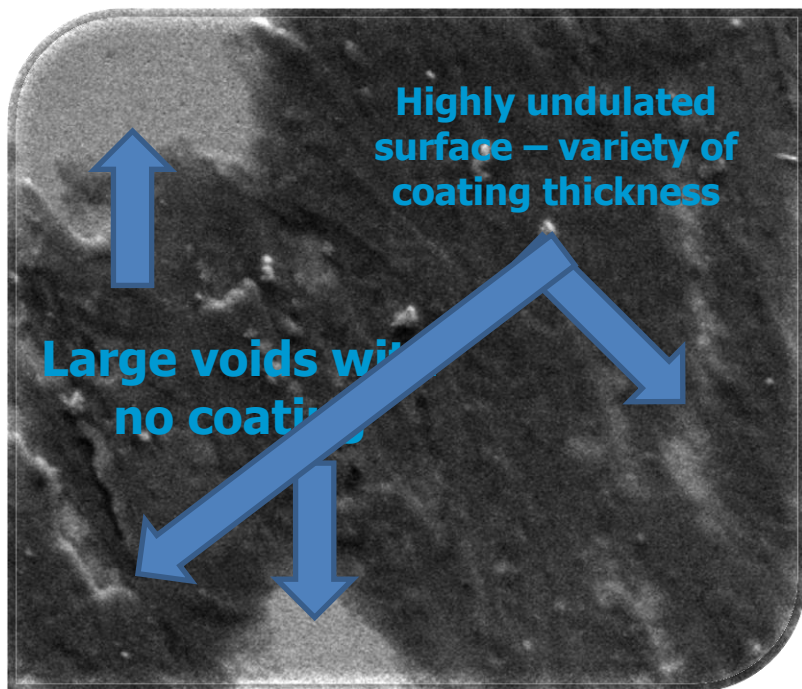
**How is WaterBlock™
unique in the
market?**

Limitations of Mechanical Seals

- Bulky
- No manufacturer warranties
- As mobile phones continue to decrease in size, the effectiveness of mechanical seals diminishes
- In fact, a major gasket and seal manufacturer is currently working with HzO to present WaterBlock™ to its customers as a solution for the next generation of hand-held devices.



SEM Microscope Comparison



Plasma Coating



WaterBlock™



A look inside:

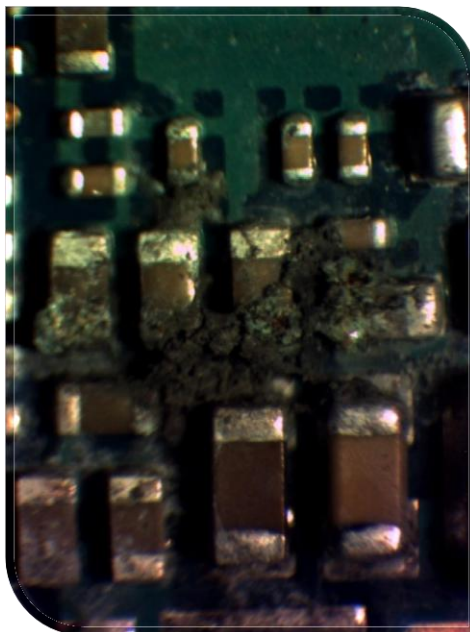
Plasma Coatings

- Thin and brittle
- +/-0.05 microns
- Changes contact angle to relieve surface tension to allow water to roll quickly away from the surface
- Protects against minor splashes and drips
- Not pinhole free

WaterBlock

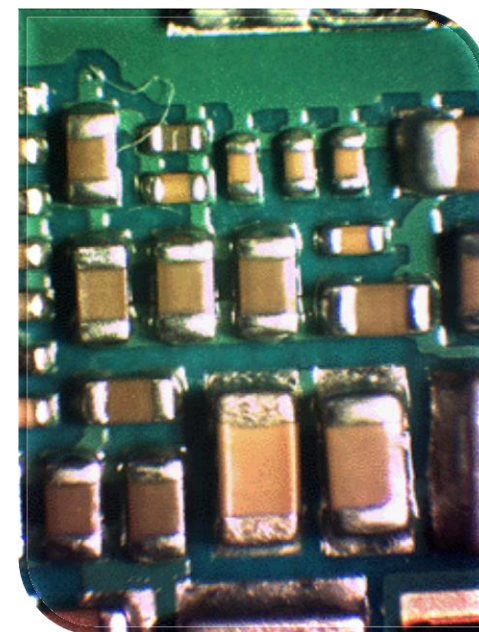
- Protection from water submersion
- Pinhole free
- 3-7 Microns in thickness
- Prevents dendrite growth

Plasma



**Minutes of
submersion
Catastrophic Failure**

WaterBlock



**Multiple Hours of
Submersion
Total Survival**

The Ideal Solution Includes:



- Coating applied at the manufacturing level
- No changes to the exterior of the device (Maintains device aesthetics)
- Protection against all levels of water and liquid damage, including prolonged submersion
- Corrosion resistant



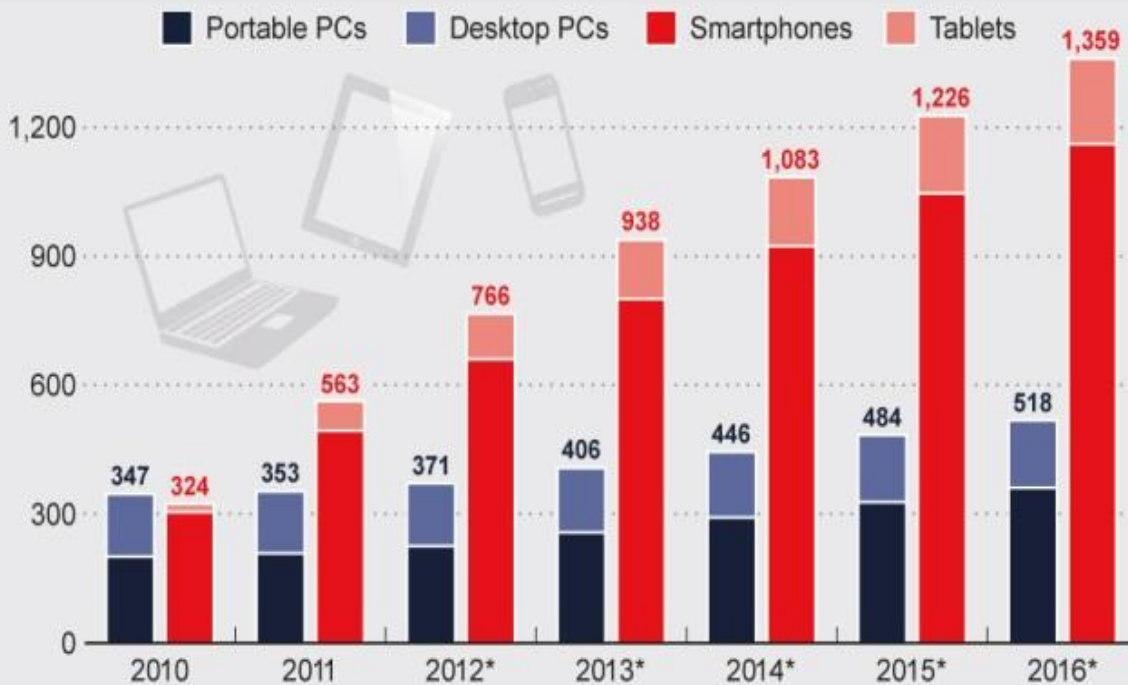


**What is the demand for
HzO WaterBlock™?**

Technology Evolution

The Post-PC Era Has Arrived

Global smartphone, tablet and PC shipments (in millions)



statista The Statistics Portal creative commons

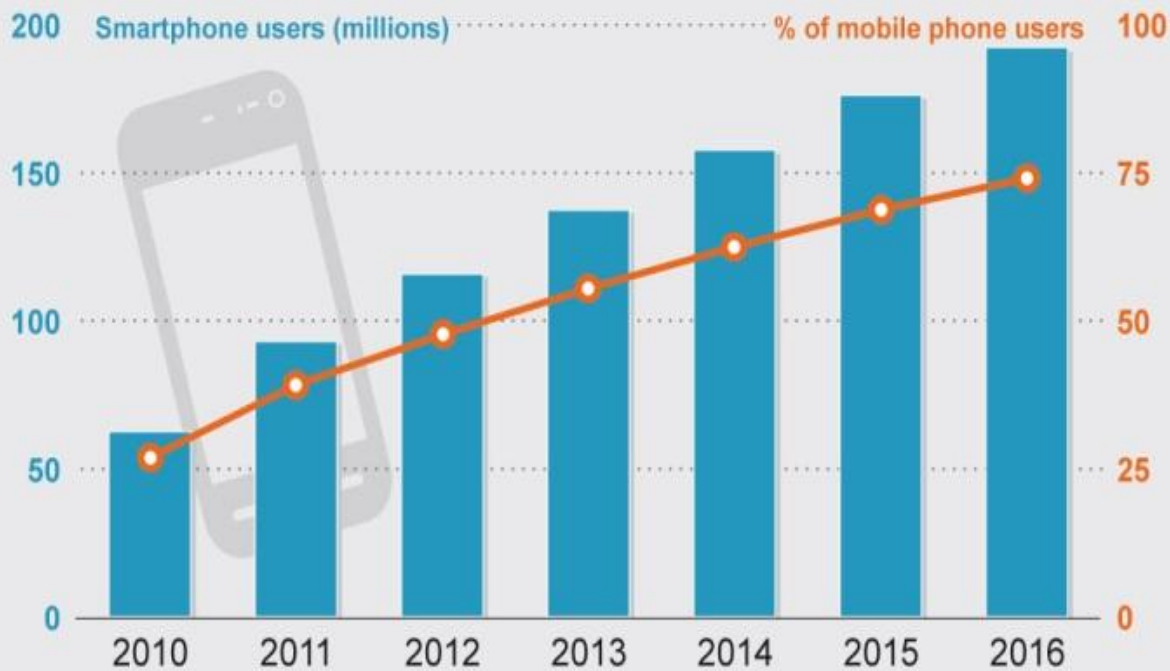
* Forecast data

Source: IDC

Technology Evolution

Smartphones Are Taking Over

U.S. smartphone user forecast



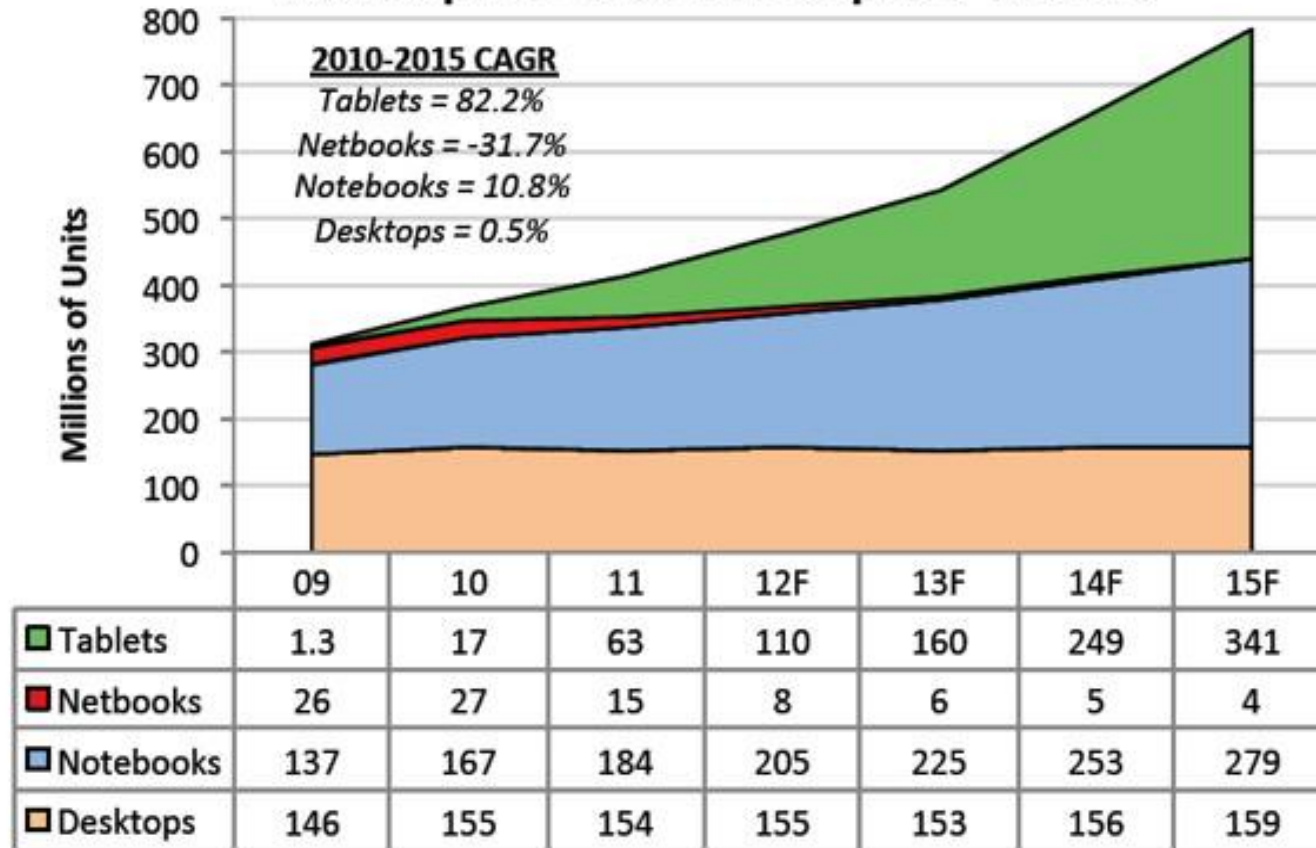
statista 

Source: eMarketer

Technology Evolution



Makeup of Personal Computer Market



Source: IC Insights





“More than 82.5 million handsets have been destroyed by water or moisture in the U.S.”

*-TNS Global Research
January 2012*



“More than 50 percent of the phones we see for data recovery are water damaged.”

*-Tal Rubin, CEO of
WeRecoverData.com
via MSNBC.com*



**More than 1.2 billion smartphones to be
on the market by 2016 (up 250% from 2011)**

*-ResearchandMarkets.com
May 2012*

WaterBlock™ Value Proposition



- 60M smartphone damage claims are filed each year (Asurion Insurance)
- Approximately 30% of all claims were water damaged related equaling +/-18M smart phones
- Total annual market value of water damaged phones (assuming average price/phone of \$500) is **\$9B**



WaterBlock™ Value Proposition



- AT&T US market share is <30%
- AT&T annual cost from water damage +/--\$2.7B
- If HzO reduces annual water damage costs by just 20% of current costs, annual savings to AT&T is <\$500M and total US cost savings are <\$1.8B

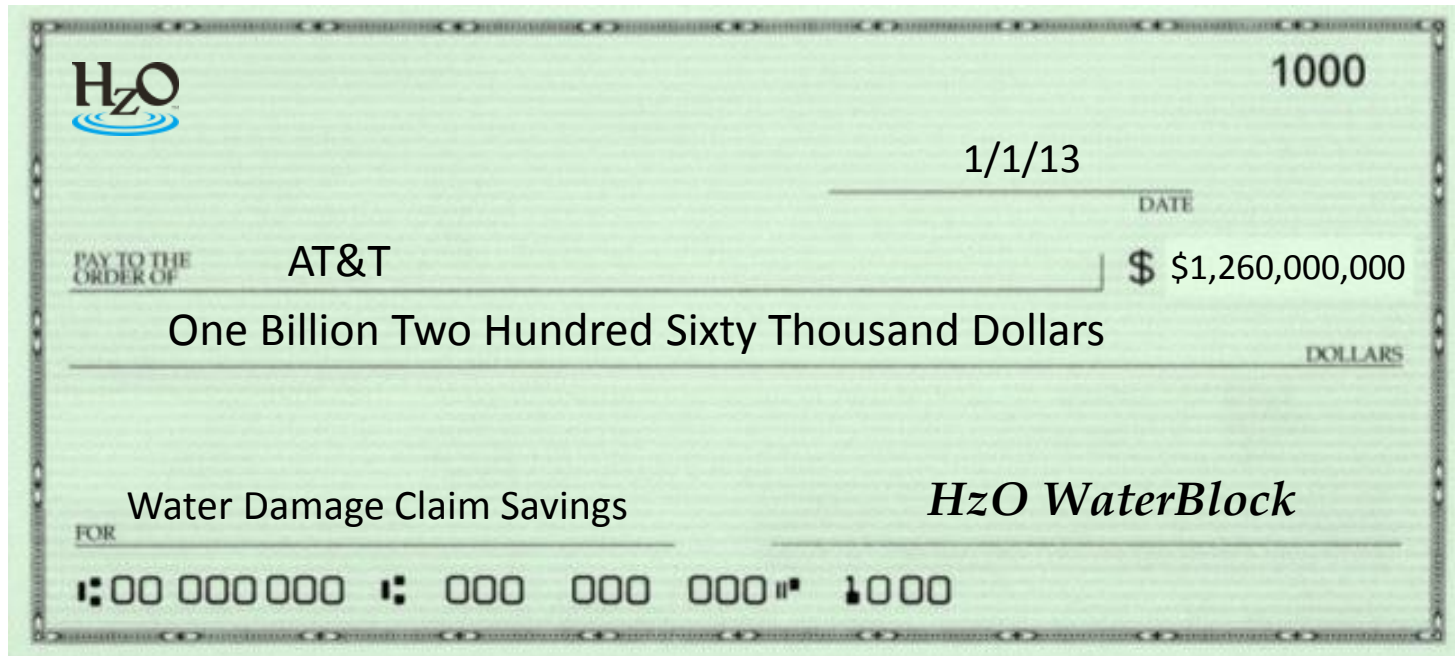


HzO Value Proposition: iPhone

- 31.5M AT&T smartphone customers have iPhones
- If 10% of iPhones with AT&T were water-damaged, 3.15M would need to be replaced each year
- 3.15M x \$400 (AT&T subsidy) per iPhone, not including handling and analysis fees
- **\$1.26B** in water damage costs paid by AT&T for replacement iPhones each year



AT&T Value Proposition: iPhone





**Why stop at
smartphones?**

H2O WaterBlock™ Market Potential

Military...

- Over 2,200,000 individuals serving in the military and over 3M communications units
- The Department of Defense's Mobile Device Strategy document (June 2012) pledges to embrace the latest in mobile device technology including COTS
- DOD is moving to encrypt Android OS devices leading to purchase of COTS purchases
- **The “million dollar raindrop” remains a serious concern**



HzO WaterBlock™ Market Potential

Homeland Security and First Responders...

- Over 800,000 law enforcement personnel in the United States
- Over 1,100,000 firefighter in the United States
- First responders and emergency personal often find themselves in compromising water situations where communication and reliable support electronics are necessary for successful operations
- **Redundant protection is highly preferred**





HzO WaterBlock™ Market Potential

Medical...

- HzO WaterBlock uses common non-toxic, biocompatible chemicals
- Ideal for medical devices and instruments that require anti-corrosion properties
- The medical device market is a \$33B industry projected to grow 8.3% per year through 2014.



The Future of H₂O



- For Xybernaut alone, its current customers include many companies that have large field forces, such as FedEx Corp., Bell Canada, and the U.S. Army and Navy, to name a few.
<http://fire.nist.gov/bfrlpubs/build02/PDF/b02086.pdf>
- Forrester projects "...five major technology platforms of Microsoft, Apple, Google, Facebook, and Amazon will soon be competing to produce a variety of "wearables."
<http://www.aiuniv.edu/Student-Life/Blog/June-2012/Wearable-Computers-In-IT>
- 14 million wearable devices were shipped in 2011; by 2016, wearable technology will represent a minimum revenue opportunity of \$6 billion
<http://imsresearch.com>

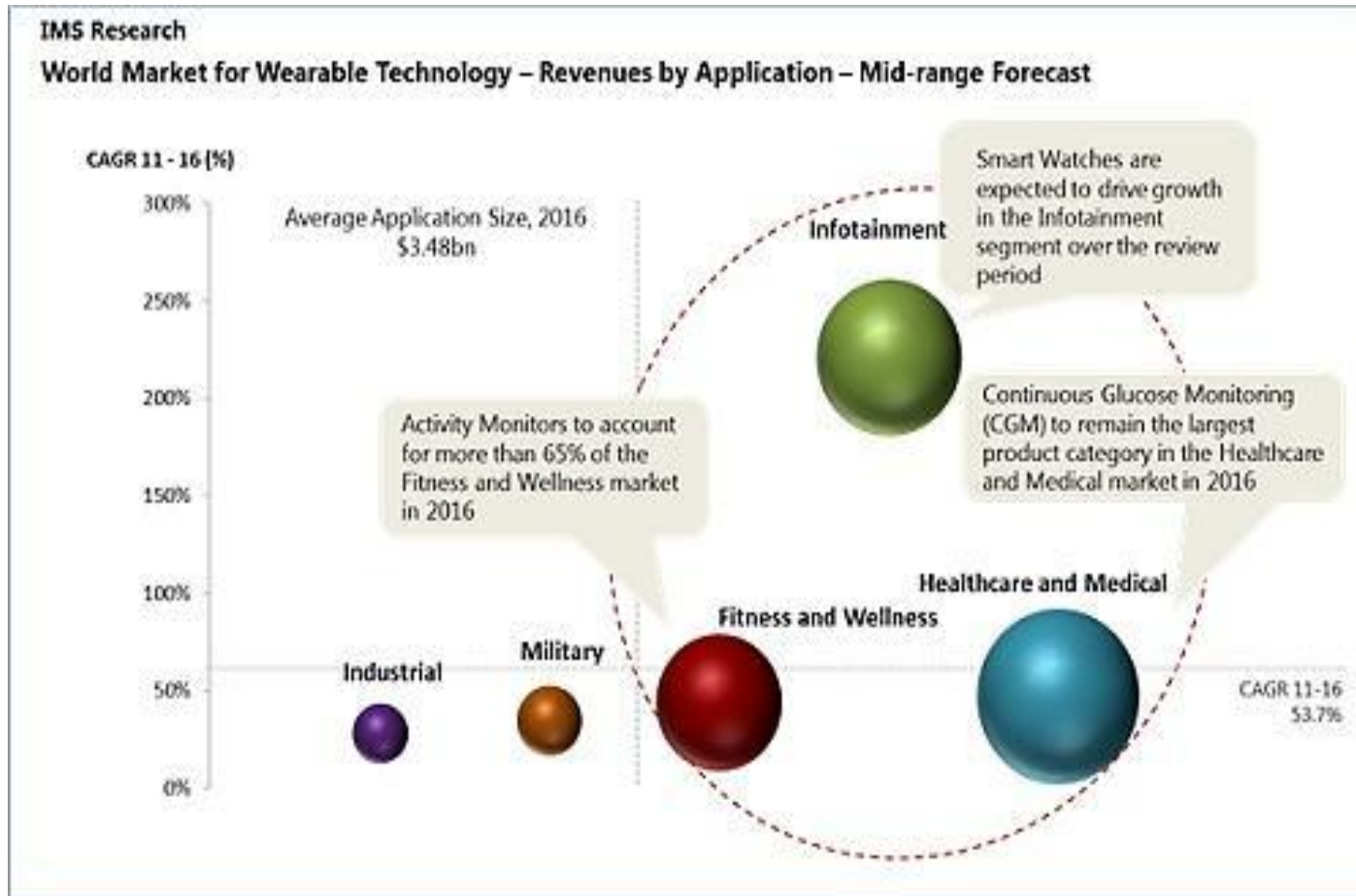


The Future of H2O

- 14 million wearable computers purchased in 2011
- Current products include:
 - Nike (Fuelband)
 - Adidas (Adizero F50)
 - Google Glasses
 - Fitbit
 - Garmin
 - Polar
 - Suunto
- Sports has driven the market. Medical applications will outpace sports by 2017
 - Sensors
 - Monitors
 - Alert systems



The Future of H2O



http://imsresearch.com/press-release/Wearable_Technology_Market_to_Exceed_6_Billion_by_2016





Industrial Applications Televisions

Medical Equipment Marine

Solar Panels GPS Devices Gaming Devices

Accessories Entertainment Devices

Smartphones Cameras Earphones

Tablet Computers Solid State Laptops

Desktop Electronics Automotive Circuitry

Emergency Response Phones Cellular Phones

**Aerospace Stationary Communication
Equipment**



HzO WaterBlock high volume application and engineering experience

WaterBlock™ 5000



- HzO's engineered proprietary high volume application equipment
- Equipment installed at HzO headquarters
- Contract coating jobs for low volume applications done at HzO headquarters





HzO WaterBlock™ R&D Experience

HzO's team of scientists and engineers have accumulated great experience and knowledge through in-house and OEM validations.

Total Different Device Models Coated

<100

Total Devices Not Successfully Treated

0

Phone Models

Tablet Models

Other Models

(mp3 players, medical units,
gaming devices, etc.)

48

17

36



HzO WaterBlock™ Testing Procedures

HzO WaterBlock™ passes or exceeds testing on IPC industry coating standards.

The following tests have been run on HzO's WaterBlock™ coating in house or by other testing units and in many instances have exceeded expectations:

- Salt Fog and Humidity Testing
- Temperature Testing
- Immersion Testing
- Water Vapor Transmission Rate
- Chemical Composition
- Corrosion Resistance
- EMI Shielding
- Humidity Resistivity
- Salt Resistivity
- Thermal Conductivity
- Thermal Stability
- Toxicity
- Vapor Transmission Rate
- Vibration
- Water Protection (IPX Standard)



H₂O WaterBlock™ Testing Summary

Actual OEM Validation Testing Results



Waterproof Coating Test:

Test Performed	Test Condition	Test Result
Machine Drop	1.0m, 6 side, 1 cycle	Touch window crack—No impact on coating
Thermal Shock	85°C ↔ -40°C 27Cycle	Passed-No Damage to Report
Temp & Humidity	+60°C, 95% 72Hr	Passed-No Damage to Report
Hand Drop	1.0m, 6 side, 1 cycle	LCD Crack—No impact on coating
IPX 7 Waterproof Test	1) 1meter, 30 min test 2) Functional evaluation check	Pass sample



H₂O WaterBlock™ Testing Summary



Actual OEM Validation Testing Results

High Temperature/Low Temperature Test:

Test Performed	Test Condition	Test Result
High Temperature	60°C, 96hr	Passed-No Damage to Report
IPX 7 Waterproof Test	1m, 30 min.	Passed-No Damage to Report
Low Temperature	-20°C, 96hr	Passed-No Damage to Report
IPX 7 Waterproof Test	1m, 30 min.	Passed-No Damage to Report

Twist/Tumble Test:

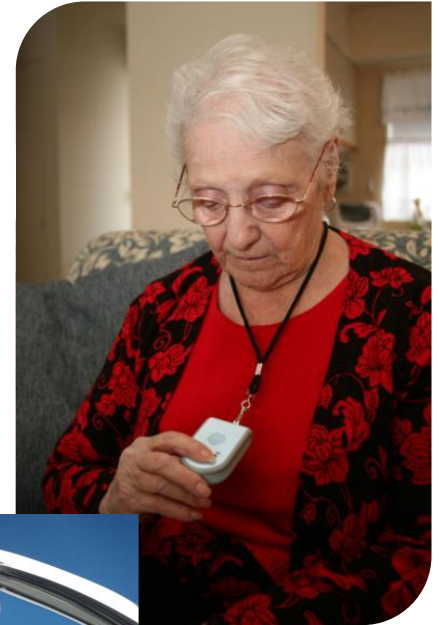
Test Performed	Test Condition	Test Result
Twist	30 kgf, Twist 5 times	Passed-No Damage to Report
IPX 7 Waterproof Test	1m, 30 min.	Passed-No Damage to Report
Tumble	1m, Random Drop (300 cycle)	Passed-No Damage to Report
IPX 7 Waterproof Test	1m, 30 min.	Passed-No Damage to Report

HzO WaterBlock™ Field Data



Validation from **medical alert device**

- Device on the market for over a year coated with WaterBlock™
- Users of this device can shower, walk in the rain, wash dishes or go to a swimming pool
- Customer demand for the WaterBlocked version has led to a back-ordered inventory
- This company has made design enhancements and required its manufactures to work with HzO



HzO WaterBlock™ Emerging Technology in a Mature market



- **Component Change.** While WaterBlock has successfully protected over 100 devices from water damage, many components are not manufactured to prevent water infiltration. Changes will occur as technology is adapted.



- **Design Change.** Most current phones are assembled on the “half shell” using the current casing. Future designs will be on independent frames and will allow easier and more cost efficient coating.



WaterBlock Adoption Benefits



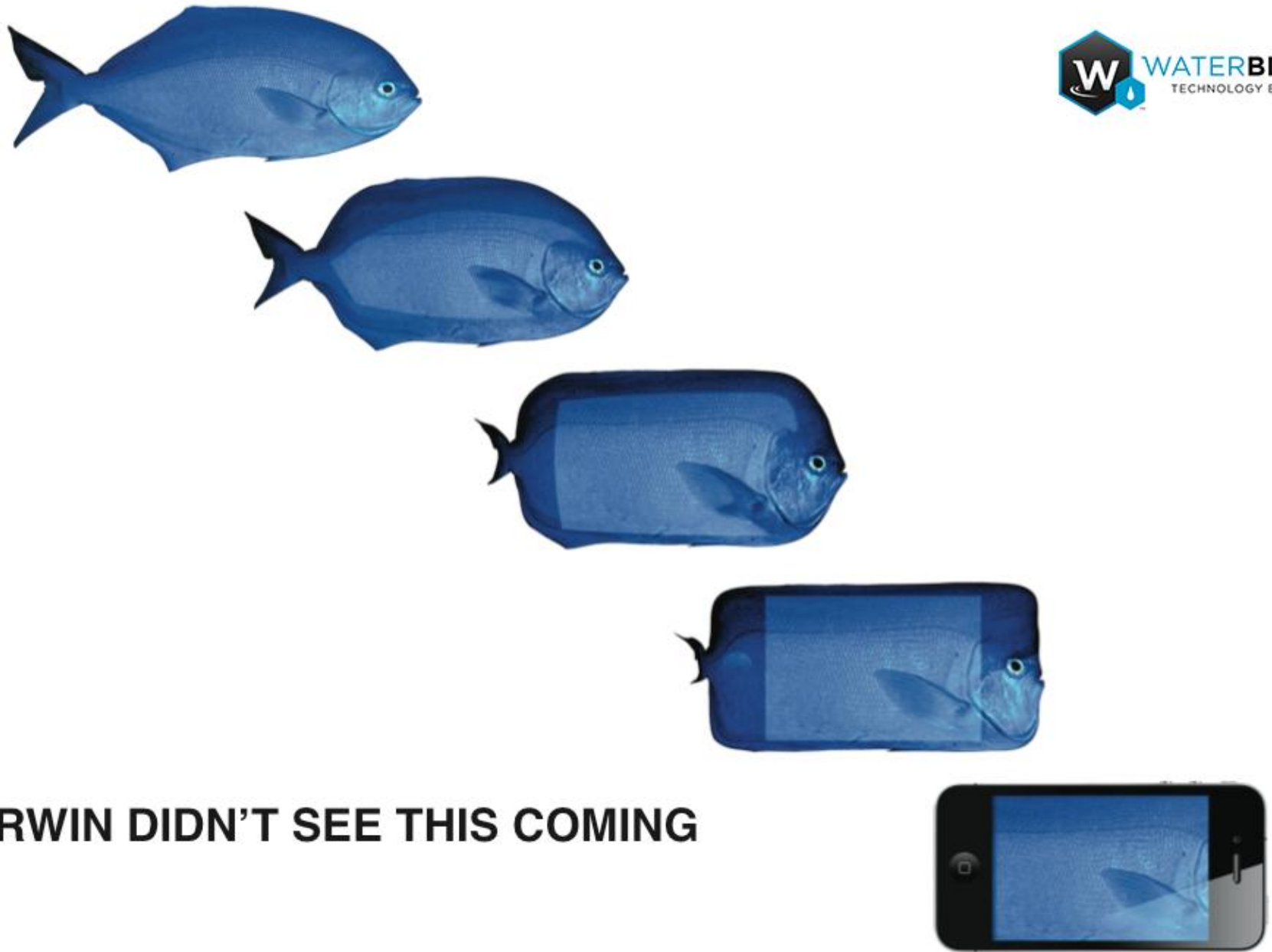
- Less money spent on returns, including damage analysis
- Greater customer trust and loyalty
- Help companies to lower their corporate liability risk
- All at a cost that is not prohibitive to ANY consumer





AT LEAST THE PHONE SURVIVED.





DARWIN DIDN'T SEE THIS COMING