

Sahib Rainu & Martin Pham

Resistant or Receptive?

Water-resistance does not mean waterproof. Uncover the truth behind the "waterproof" phone.



Resistant or Receptive?

Sahib Rainu & Martin Pham

One of the main concerns when buying an iPhone has always been a solid stance on, "Is it waterproof?". In short, the iPhone is water resistant but not water proof meaning that splashing a bit of water on it is completely fine but dowsing and drowning it in water is not recommended.

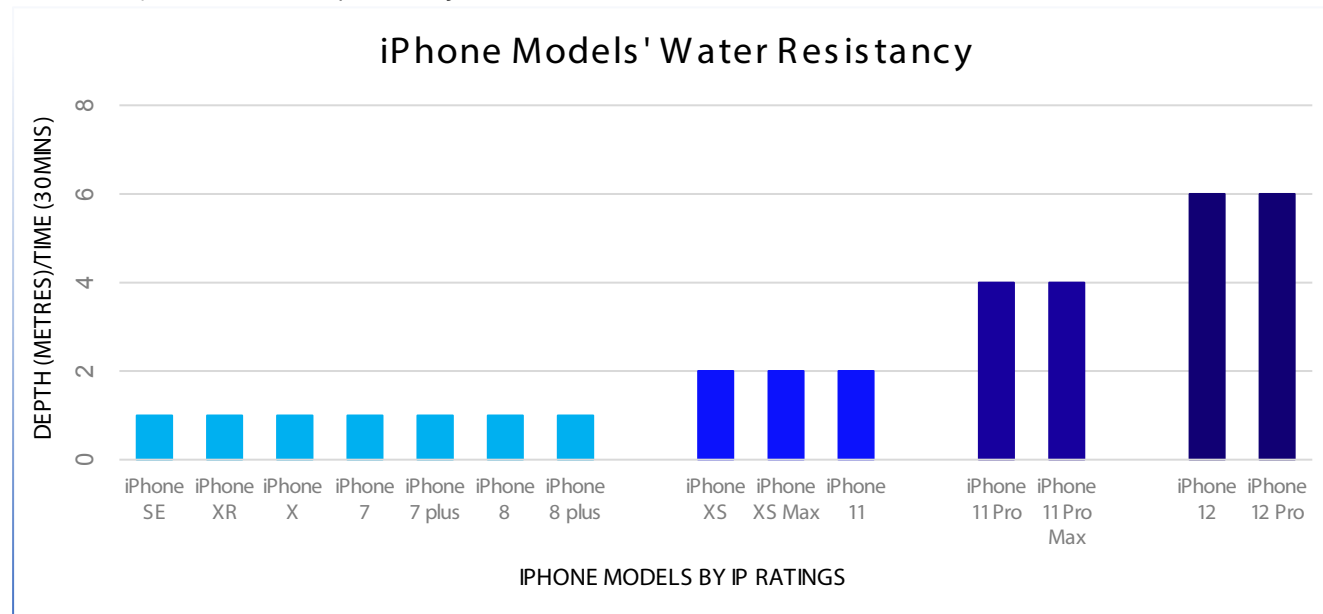
To say that a phone is completely waterproof is often not what it seems, as it implies that the phone is impermeable to water. While the new iPhone is water resistant, it isn't waterproof by definition.

Phone companies measure the water resistance on a universal scale known as 'IP' (International Protection or Ingress Protection). Water and dust molecules are prevented from entering into the iPhone through the use of rubber seals and adhesives used in the openings of the iPhone which include the charging port, buttons and sound ports.

Waterproof rating

The latest iPhone has an IP rating of **IP67**. This coding is the measurement system for the amount of dust and moisture that is penetrable in the device. The first number, being '6', refers to the device's resistance to dust. The second number, being '7', refers to the device's resistance to moisture. The new iPhone has the highest dust resistance of 6, making it entirely resistant to the substance, as well as being immensely resistant to water - having the moisture rating maxed out at 9.

To put the terms of IP into perspective, a moisture rating of 7 indicates water resistance up to a depth of 1 meter for 30 minutes and a moisture rating of 8 indicates water resistance up to 1.5 meters for 30 minutes. Hence, a moisture rating of 9 can withstand high pressure environments for a longer period of time.



What is protected?

The iPhone has many gaps that allow moisture and dust to enter but how does apple prevent occurrences like that to ever happen? How are the charging ports, speakers and microphones affected? Well the answer is in the way Apple designs their phones. With a lot of **Glue**. The gaskets or adhesives are used to seal the areas off from dirt and moisture.

The parts that are often pressed such as the touch screen and home button are protected using adhesive glues and rubber gaskets that possess specific elasticity to achieve a tight sealing effect. These important aspects **help prevent moisture** by creating a barrier. Double sided tape is used for the camera and components that involve sound use mesh and rubber gaskets. Apple uses a rubber gasket ring to close off any water from entering within the sim tray and the main body.

So which iPhones are protected?

iPhone models from iPhone SE to the iPhone 8 plus have an IP rating of IP67 while the models from iPhone XS to iPhone 11 have an IP rating of IP68. Phones with an **IP67** can be submerged

into water depths of 1m for up to 30 minutes while phones that are rated **IP68** can be submerged into water depths of 2m for 30 minutes. Although these phones can withstand the pressure and the submersion of water for these periods of times, testing these limits at home is not advised as apple does not cover water damage cost so be careful!. These phones have been tested against common liquid spills such as fresh water, soda, coffee and beer but it doesn't necessarily mean that it could be protected from chlorine and salt water.

My phone is wet, what do I do?!

Apple has advised customers to avoid swimming, bathing and showering with their phones and if there is any event that happens to make your phone potentially soaking wet, you could always quickly rinse, dry and wipe all external components of any moisture. Even the old trick of sticking your iPhone into rice could work depending on the severity!



iPhone 11 Pro Chassis (inner structure of the phone model) bound together tightly with strong adhesive glue, to prevent water and dust from passing through.

References:

Water-Resistant Smartphone Technologies. (2020, October 18). Retrieved from <https://ieeexplore.ieee.org/abstract/document/8671469>

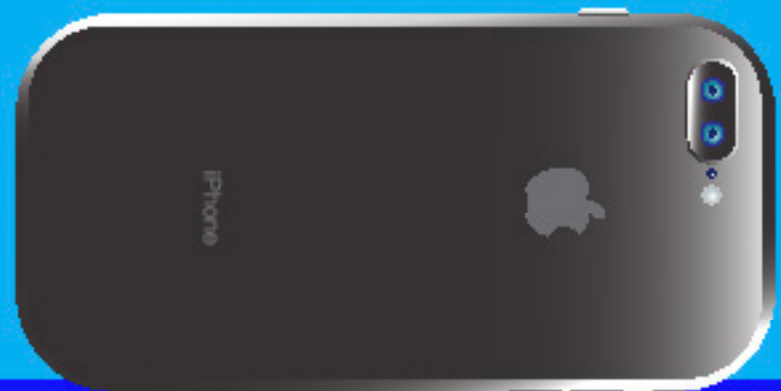
How Water Resistant are iPhones? (2019, August 16). Retrieved from <https://www.catalystlifestyle.com/blogs/here-we-are/how-water-resistant-are-iphones>

Dylan @ Orchard. (2020, August 4). Is iPhone X Waterproof? The Last Article You'll Need To Read | Orchard. Retrieved from <https://www.getorchard.com/blog/is-iphone-x-waterproof/#:~:text=Apple%20Doesn't%20Cover%20Liquid%20Damage%20Under%20Its%20Warranty&text=The%20company%20observed%20water%20resistance,water%20resistance%20are%20temporary%20conditions>

Apple. (2020, July 24). About splash, water, and dust resistance of iPhone 7 and later. Retrieved from <https://support.apple.com/en-us/HT207043>

Orellana, V. H. (2018, October 14). Just how waterproof is the iPhone XS? Retrieved from <https://www.cnet.com/news/iphone-xs-waterproof/>

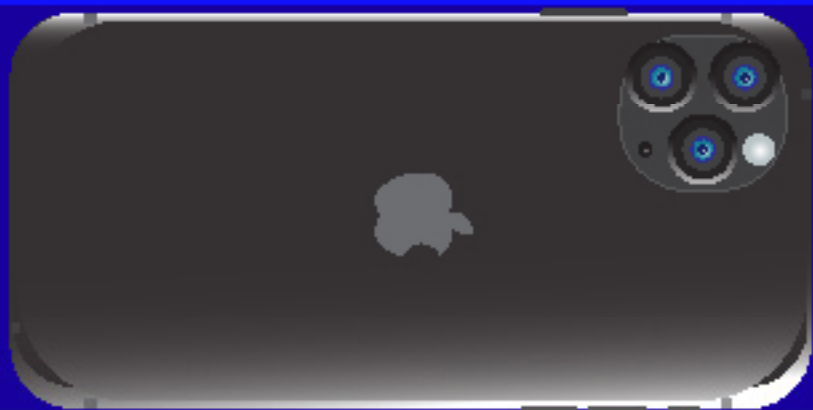
Hollister, S. (2016, September 21). Waterproofing explained: How Apple, Samsung and Sony keep the liquid out. Retrieved from <https://www.cnet.com/news/how-does-waterproofing-work-apple-iphone-7-samsung-galaxy-s7-sony-xperia/>



IP67

1 Metre

iPhone XS
iPhone XS Max
iPhone 11



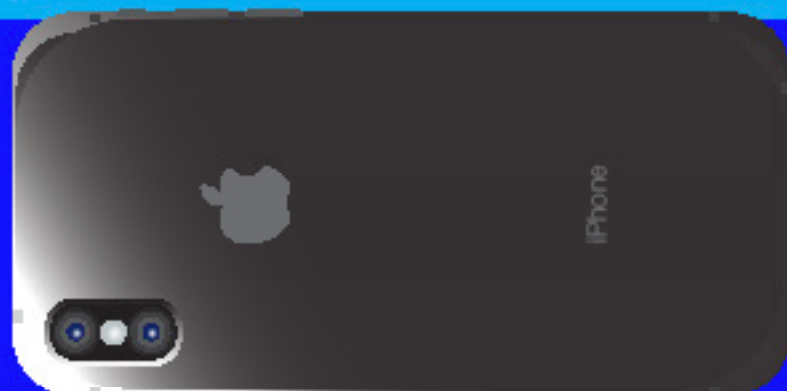
IP68

4 Metres

iPhone 12
iPhone 12 Pro

iPhone SE
iPhone XR
iPhone X
iPhone 7
iPhone 7 Plus
iPhone 8
iPhone 8 Plus

30:00 Minutes



IP68

2 Metres

iPhone 11 Pro
iPhone 11 Pro Max



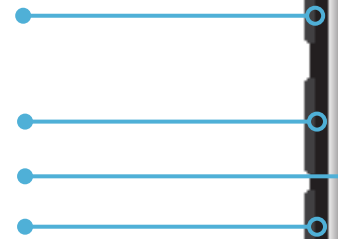
IP68

6 Metres

Finely fitted watertight mesh which covers the entire speaker region, not allowing dust or water molecules to pass through.



The volume, power and ringer button are all sealed with multiple rubber gaskets and adhesives.



Rubber gasket used at the entrance of the sim card tray to tightly seal it within the iPhone. This does deteriorate overtime just like the multiple adhesives in an iPhone.



Lightning Port - where you plug in your charger - sealed with various rubber gaskets. Still HEAVILY Advised to not charge your phone if water has been splashed onto it! Apple has been looking into removing this socket for future models of iPhones, in order to really stabilise and secure each airway that



The thing that makes the new iPhone models more resistant to water and dust is the additional value from Apple's decision to remove the physical home button, making it run solely through gestures - in order to reduce the points of "hardware failure".