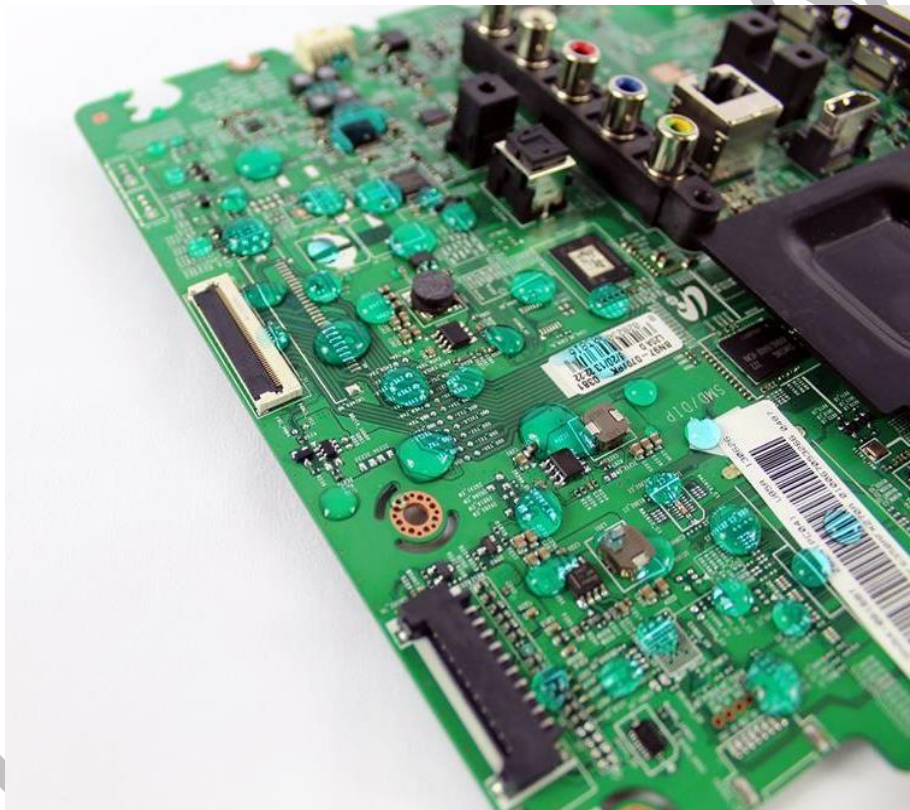


# NANOFLOW<sup>TM</sup> X

## VX3

ELECTRONIC WATERPROOF NANOCOATING



TECHNICAL DATA SHEET

# NANOFLOWX<sup>TM</sup>

## OVERVIEW

NanoFlowX VX3 is designed to protect electronic devices against dust, humidity, moisture, liquid and corrosion damage with added resistance to saltwater. The organosilicon non-fluorinated polymer coating is thin, durable, quick curing and low odor. In the quest to create more durable electronics, NanoFlowX can help increase the lifespan of all electronic devices. It is the easiest, fastest, and most affordable protection for any smartphone or tablet. With or without taking the device apart, our product uses invisible coating to protect tablet/smartphones against water, dust, and scratches. The application is quickly and easily done within minutes. Our Nanocoating for electronics is also non-flammable with an anti-microbial agent. It can also be used to coat printed circuit board (PCBs), speakers, and many other electronics. VX3 offers a replacement for the outdated conformal, plasma, and vapor deposition coatings at a lower price with less impact to the environment.

## APPLICATIONS

- PCB board and electronic components
- Consumer/Industrial Electronics
- Motors
- Drones, Robotics
- And More

## FEATURES

- IPX67 and IPX68 Tested
- Protects against dust, humidity, liquids and saltwater
- Provides UV and corrosion resistant
- Invisible coating; firm and stable attachment to substrate surface
- Quick process: Air cure in 24 hours
- Thickness of 2-4 $\mu$ m
- No masking required
- Ether like – Fruity Odor
- Reworkable – unsolder components and resal reworked area with a pipette and VX3 solution
- Refractive index: 1.376

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## COMPOSITION

Chemical Name: Organosilicon Polymer

Chemical name	CAS No.	EC No.	Composition %
Hexyl Acetate	142-92-7	205-572-7	50-70
Trimethoxymethylsilane	1185-55-3	214-685-0	1-5
Proprietary Chemical	N/A	N/A	25-45

## TYPICAL PROPERTIES

Test item	Test result
Exterior	Liquid
Color	Colorless, clear, or pale (Yellow with UV trace added)
Odor	Ether like – Fruity Odor
Flash Point	>17 C
Density	0.853 g/ml
Oxidation	Not classified as an oxidizing agent

Declaration: the TDS by our company, in the forms of oral or written, is to provide guidance instead of guarantee. Our company does not guarantee application scope and its functions. Please consult technicians before using it. Product will be adjusted according to the requirements of the customers.

## APPLICATION METHOD

NanoFlowX VX3 is a custom solution developed to meet a specific need; therefore, application varies by product. Dipping process only.

Surface Preparation: Ensure electrical components are free of dust and oil. Contaminated components will prevent the coating from adhering to the surface which will result in an ineffective coating. Self-cleaning solder flux is not an issue. Do not submerge or apply solution to LCD screens.

Dipping Instructions:

- Remove the electrical component(s) to be treated from original device, if necessary. We do not recommend using VX3 on devices with LCD display unless the display is completely sealed
- Use a clean glass or HDPE tray or beaker preferably a little larger than the electronic component to allow the device to be submerged in a bath of VX3 with the connectors downwards.
- Slowly pour the solution on to the electronic components in the tray ensuring the solution fully covers the electronic components.
- Wait until all air bubbles from the electronic components are gone or for at least 10 seconds fully submerged.
- Slowly remove the electronic component by tilting it to one side to allow excess solution to drain from the device making sure the electrical connectors are facing draining first. Solution will air cure in 24 hours. For best results, please place the device in a curing oven set at 90 °C (194 °F) for up to 10 minutes then air-cure for 8 to 24 hours.
- Use a water dropper and place several drops of water over the component and check if the water beads have a contact angle.
- Solution will begin to evaporate if left exposed, please pour used solution into a HDPE bottle using a 100-micron strainer and tightly seal bottle.

Rework Warning: Any new solder points and or connections may remove the coating. Place a few drops of VX3 solution using a water dropper or spray bottle to touch up newly solder points and/or connections.

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## HANDLING INSTRUCTIONS

- Please be sure to refer to MSDS before you use the solution.
- Wear glasses during use and be careful to avoid contact with eyes. In case the product comes into contact with the eyes, immediately flush the contaminated eye(s) with a large amount of water for at least 15 minutes. Seek medical attention if irritation persists.
- Wear rubber gloves and protective clothing during use. If it comes into contact with skin, immediately remove contaminated clothing and flush skin with water and soap. If signs/symptoms develop, seek medical attention.
- Avoid inhaling vapors. Work in a well-ventilated place. For excessive inhalation, immediately transfer the patient to an area with fresh air. If the patient stops breathing, please provide artificial respiration. If breathing is difficult, provide oxygen and seek medical attention.
- Do not ingest. If the product is ingested, immediately obtain medical attention. Do not induce vomiting.
- Store at room temperature 7°C - 29°C (45°F - 85°F) and keep away from direct sunlight or heat. Keep lid tight and secure after usage.
- The shelf life of an unopened bottle is 2 years. The shelf life of an open bottle is 1 year.

## FORM OF PRODUCTS, UNIT OF PACKAGING

Volume of contents: 200 ml, 1 L, 4 L, 16 L, 20 L, 200 L Drum

Packaging: Closed HDPE plastic bottles and/or Metal Drum

## LIMITED WARRANTY INFORMATION

Unless an additional warranty is specifically stated on the applicable NanoFlowX product packaging or product literature, NanoFlowX warrants that each NanoFlowX product meets the applicable NanoFlowX product specification at the time NanoFlowX ships the product. NanoFlowX MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR

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FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If the NanoFlowX product does not conform to this warranty, then the sole and exclusive remedy is, at NanoFlowX's option, replacement of the NanoFlowX product or refund of the purchase price.

Limitation of Liability: Except where prohibited by law, NanoFlowX will not be liable for any loss or damage arising from the NanoFlowX product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

## FAQ

### **What is the expected evaporation rate? Do we have an evaporation curve vis-à-vis temperature and humidity?**

- Evaporation rate is about 1ml per 10 min based on the sample tray size at ambient. The evaporation rate is  $0.0357 \text{ mL} / \text{cm}^2 / \text{hour}$ . However, this will vary depending on the type of board disturbing the surface of the solution and also the solution's exposed area. After 5 hours total time of dipping boards using the same solution, it is recommended to refresh with more solution as the solvent will evaporate off to the point where the solution is too concentrated. However, this can be experimentally streamlined if you want to use the same solution as one can continuously dilute the solution to maintain a specific concentration range

### **Health Hazards: If accidentally VX3 goes in the eyes what would happen?**

- MSDS has instructions regarding first aid; in our instructions we clearly state what people should have – lab coat, gloves, and goggles.

### **What is the consumption rate?**

- *For example, how many 6" inch x 8" inch PCB boards can be coated with 1 liter of VX3 Solution?*

Calculation is based on surface area – general rule is using the square inch of the PCB board x 0.16

*Eg:  $6 \times 8 = 48 \times 0.16 = 7.68 \text{ ml}$  consumption rate - depending on the price per liter you sell for will be the price to coat each unit.*

### **What is the order and delivery process like?**

- This is all predicated on the customer, delivery time, freight cost, and customs clearance. We can typically fill orders in 2 -5 days depending on volume and container size the customer

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desires. Volumes come in 200ml, 1L, 4L, 16L, 20L and 200L Drum format.

## **Can we have a video of automated systems with conveyor belts and robotic arms in operation?**

- While it is possible to automate the process of coating the products with conveyer belts and robotic arms, we are not allowed to take videos of customers' facilities. We do have videos of spray lines and custom gig; there is no video of robotics.

## **Is the coating reworkable?**

- The coating is reworkable with either re-dipping into solution or individual spot-check rework with a pipette.

## ENVIRONMENTAL POLICY

NanoFlowX will continue to recognize and pursue its responsibility to prevent pollution at the source, or even before, wherever and whenever it is possible. We will develop products that will have minimal effect on the environment; preserve and conserve natural resources through the use of reclamation and other appropriate methods; and assure that its facilities and products meet and sustain the regulations of all federal, state, and local environmental agencies either at locations in the USA or foreign territories (to the best of our abilities); and condone, promote, and assist, wherever possible, governmental agencies and other official organizations engaged in environmental activities.

## RESOURCES

NanoFlowX solutions are supported by global sales, technical and customer service resources, and with technical laboratories in U.S.A. The products that NanoFlowX have researched and developed benefit the user by increasing product quality and durability.

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