

NANOPROTECH—Electric 2018



Application Preparation—Protective clothing requirements

Product Application Procedure

Requirements

Support

Property of AKAM ORDER MANGEMENT (PTY) LTD. 1 Patryspoort Str, Woodland hills Wildlife Estate, Bloemfontein, South Africa, 9301





PROTECTIVE CLOTHING REQUIREMENTS

PROTECTIVE MEASURES FOR HIGH LEVEL MAINTAINANCE

1. Wear head protection as per prescribed high altitude or rope-access prescription gear.
2. Wear reflective and highly visible PPE clothing in order to be visible to other co-workers operating industrial machinery.
3. Wear safety shoes applicable to the required working conditions. (See rope-access requirements)
4. Wear protective eye wear / goggles in order to avoid eye contact with product during surface application.
5. Wear protective gloves in order to avoid skin contact with product during product surface application.
6. Wear mouth and nose protective mask in order to avoid inhalation of product during product surface application.

FIRST AID MEASURES

After inhalation—Provide fresh air. Seek medical attention should problems persist.

After contact with eyes—If product gets into eye, keep eyelid open and rinse immediately with large quantities of clean water for at least 5 (five) minutes. Subsequently consult an ophthalmologist.

After contact with skin-Subsequently wash again with: Clean water and soap. Rub in high fat content cream. In case of skin irritation, seek medical treatment.

After ingestion-immediately get medical attention.

- Use only in well ventilated areas.
- Protect against heat and insolation.
- Provide a suction section for room air on ground level. (Concentrated vapors are heavier than air.
- Only use in places where open fire and other sources of ignition can be kept away.

INDUSTRIAL UNIFORMS

All Nano service providers/contractors and their employees should adhere to prescribed industrial requirements as per Client minimum specification determined prior to commencement of any contract / project.

UNIFORM REQUIREMENTS

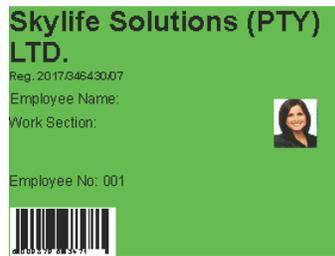
- ◆ Identification cards containing employee name, ID number, ID photo, Section of work and employee numbers.
- ◆ Wear uniform safety workwear at all times when on site / work place.

SAFETY REGULATION

All Nano service providers/contractors and its employees should adhere to specific client / project safety regulations on premises at all times. Service providers / contractors and employees should go through proper induction of clients standard operating procedures. See Basic Conditions of Employment act no 75 of 1997—SA.



Example of Employee ID Card.



HVLP Machine



PRODUCT APPLICATION METHODS (RECCOMENDED)

1. For proper surface application use HVLP machine (Ryobi 500 WATT) for bigger areas (container size generators)
2. Product can also be applied through dipping, or brushing. Excess residue may be recycled for re-use through dipping method / dipping pan.

APPLICATION PREPARATION—SURFACE

- ◇ Rub away all excess dust with microfiber cloth. Alternatively wind/air surface cleaning through compressor or HVLP machine, only containing air, can be used in order to blow away all dust and excess organic and non wanted matter on desired equipment/surface.
- ◇ Nanoprotech Electric Coating will even penetrate existing non wanted matter i.e. green / white corrosion and break down insulation resistance within 10 (ten) seconds. Subsequently current will be fully restore after application.

Nanoprotech Electric coating application

- Apply Nanoprotech Electric to desired surface through HVLP machine, dipping or brushing via paintbrush.
- Allow product to penetrate and bond with desired surface for 10 (ten) minutes to 24 (twenty-four) hours.
- For devices running at high revolution i.e. drills, grinders, motors, pumps, etc. It is required that that all excess oil be allowed to dry / drip of be wiped off with cloth. Allow Nanoprotech to cure for at least 100 hours.
- Oil residue (Highly purified mineral oil) may be removed if desired with microfiber cloth, wind compressor air gun or water.
- Apply Nanoprotech Electric directly onto chipboards, open wiring, connectors and all sorts of electronic and electrical current conveyers.
- Product availability—see price list for packaging.

3. Vital product informational requirements:

1. Under normal electrical flow circumstances, current leakage would not necessary cause damage to all non treated equipment. Water thus not containing electrolytes might as a result thus also not cause current leakage.
2. Electrical motors running in dry conditions will most of the time retain full power output. Their functionality is determined through the friction and wear they experience while being used. Current leakage dramatically occur when these electrical motors and their working components are exposed to moisture and water containing electrolytes. As an; example electrolyte rich water is typical mine or industrial water. Nanoprotech Electrical solution was tested and tried in Europe on railways Trolley busses and Trains in order to determine what benefits it offers to motors and retention of electrical current. The result was that these treated components required less electricity to function at full capacity due to the fact that they were treated with Nanoprotech Electric.
3. Some conventional oils are hydrophobic but Nanoprotech Electric is Super Hydrophobic. Nanoprotech Electric requires its carrier oil (highly purified mineral oil) to enable the Nanoparticles to be transported evenly over the required surface. If the carrier oil is not present the treatment may become less effective over time as these Nanoparticles can be damaged and thus requires re-application. Where there is no possible damage to the Nano film, the Super Hydrophobicity will be retained.
4. Treated equipment, when submersed under water, will trip the earth leakage in most cases, but keep the equipment from being damaged by the water, including electrolyte-rich water.
5. Nanoprotech Electric increases insulation resistance which results into an increase in safety. However it remains vitally important that all safety rules and regulations is adhered to all times when working with electricity as prescribed. Nanoprotech Electric is designed to protect electrical equipment against water and moisture damage and NOT to use treated electrical and electronic components outside their limitations. Nanoprotech does not guarantee a shock-proof working environment however vigilantly reduces risk of electrocution.
6. Treated equipment will within the first ten to fifteen minutes become hydrophobic. Full Super hydrophobicity is reached after one hundred hours when nanoparticles have bonded with the micro-cavities within the treated surface. Keep in mind that once treated the components will show significant protection against moisture after twenty-four hours.
7. Although Nanoprotech Electric acts as an insulator against moisture it is NOT a substitute for plastics and rubber where there is exposed open wire, circuit breakers, conductive surfaces or plugs. An increase in insulation resistance is a key factor which prohibit short circuits and current leakage. But this will increase over the first one hundred hours after application. The negative effect of water and moisture however is immediately decreased



NANOPROTECH ELECTRIC PROTECTIVE COATING



25L Concentrate

3.1 Vital product informational requirements cont:

8. Product life span—at an average temperature of +80°C Nanoprotech Electric within a closed confined space would last a minimum of one year from initial application. In the case where there are continuous air-flow via electrical fan or cooling units, it will probably have a short life span.
9. Exposed wiring such as the inside of an electrical motor which are continuously exposed to friction and wear during operation will ideally need to be dipped into the solution and then drained from all excess liquid over the first twenty-four hours. Thereafter it is advised that the motor be retreated via spray on application on a quarterly basis for protection against moisture.
10. Equipment such as drills, pumps, electrical motors, alternators, etc. should be allowed to drain from all excess oil over a minimum of twenty-four hours.

Keep in mind: All oils and lubricants are flammable when exposed to high revolution friction and wear.

Nanoprotech Electric Coating—Product information

- ◇ Nanoprotech Electric can with-stand up to 1500v or 256 kVa.
- ◇ 100% Water displacement within 10 (ten) seconds.
- ◇ Heat resistance— +250°C.
- ◇ Cold resistance—80°C.
- ◇ Product (Aerosol cans only) is highly flammable due to butane gas content within canister.
- ◇ Product may cause skin irritation if in direct contact.
- ◇ Preparation of highly refined mineral oil, anti-corrosive additives, anti-oxidants and aromatic free paraffin and naphthenic hydrocarbons.

Handling and Storage

- ◇ Protect against heat and insolation.
- ◇ Keep in cool place.
- ◇ Keep away from food, drink and animal feedstuffs.

Appearance

- ◇ Green oil-based liquid.

Application fields

- ◇ Nanoprotech Electric protects electronic and electrical devices and installations from humidity and wet conditions of all kinds. It guarantees the electric conductivity of connection assemblies and contacts even under water, without leading to the otherwise inevitable short circuits or flash overs.
- ◇ Nanoprotech Electric protect circuits against corrosive action of electrolytes, salt water, acid and chlorine vapours for extended periods of time.
- ◇ Nanoprotech uses the most advanced nanotechnology to deliver unparalleled results. Significantly prolonging the service life of domestic and industrial machinery by simply protecting it from water damage and corrosion.
- ◇ Low voltage or high voltage, AC or DC—it does the job.
- ◇ Insulates against short-circuiting—eliminates the risk of damage from water exposure.
- ◇ Easy application—use on any electrical equipment.
- ◇ Dries within minutes, however recommended curing time is minimum of 24 (twenty-four) hours.
- ◇ Coating will last minimum 1 (One) year. Effective 72 hours under water.

Benefits

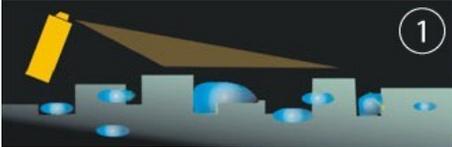
- ◇ Long term prevention of current leakage and short-circuits.
- ◇ Safety against electrocution hazards, especially for children.
- ◇ Safety against electrocution for workers using electrical tools in wet or humid conditions.
- ◇ Dynamic & adaptable agent.
- ◇ Preventative solution against Corrosion Under Insulation (CUI), as the coating builds a barrier against moisture build up beneath the traditional insulation



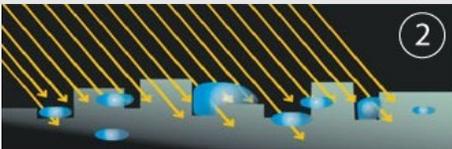


- ◇ Clear finish of coating allows visual inspection of device.
- ◇ Allows for post-treatment soldering.
- ◇ Fast setting time (10 mins) speeds up maintenance & installations.
- ◇ Reduces maintenance , equipment replacement and labour costs.
- ◇ Free from polycyclic hydrocarbons, fluorinated or chlorinated hydrocarbons, resins, silicones, Teflon and aromatic compounds.

How it works:



- ⇒ Fills micro cavities (in circuit boards, micro circuitry, electric coils, etc.) Powerful capillary effect allows the product to penetrate inside the blocks without dismantling. Excellent water repellent properties and low surface tension allow it to form a thin protective nano coating penetrating under the water (micro) layer. After spraying, a protective nano coating forms on the surface. Nanoprotech electric provides 100% water extrusion rate within 10 (ten) seconds. Intelligent and dynamic , the coating ensures a water repellent barrier at all times. When components are attached, the coating opens allowing ion exchange. Detaching components then actions the coating into closing up over the newly exposed metal surfaces to prevent short-circuiting.



- ⇒ In case of electrical motors where winding components remain in close (micro) and proximity, flashovers may still occur. However where there are minor gaps between rotors, starters, brushes, etc. components will be significantly protected against flashovers caused by moisture.



- ⇒ Nanoprotech Electric will significantly enhance surface resistance on components that transmit or carry current but is not suitable for already damaged components.
- ⇒ Nanoprotech Electric will not have any negative effect on electrical motors or components. Nanoprotech carries recorded test reports on various treated components and motors for Trolley busses, Seaport tests, Railways tests, Tram tests and St. Petersburg water canal tests.



- ⇒ Nanoprotech creates a hydrophobic surface once applied. For static applications the product would provide protection for up to 72 hours on treated components. Where components are rotated submersed under water, protection time might be significantly reduced due to abbreviation , friction and exposure to sand, mud, etc.
- ⇒ Nanoprotech carries strong anti-corrosive capabilities which will protect the treated surface against corrosion. Because of this, there remains a significant risk reduction in flashovers for treated components. Components i.e. electrical motors, alternators, etc. will operate rapidly more reliable in high humidity and wet conditions. Time between failures also referred to as "meantime between failures" will be radically increased. As a good example, SASOL Secunda have specified Nanoprotech Electric as a requirement treatment on all newly purchased LDV Alternators for the purpose of moisture protection.

Important

Ensure all contractors, employees and project managers are well familiar with MSDS certification of Nanoprotech Electric prior to commencement of any application service.

Following the correct application methods with all the requirements (cleaning, application and curing) will result into an increase in equipment's life-span.

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ELECTRIC PROTECTIVE COATING



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TECHNICAL INFORMATION

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