



nanoDefense™

Self-Cleaning Surface Protection for Common Touchpoints

nanoDefense™ is the safe, effective solution to show you care.



It is a remarkable, natural, self cleaning surface technology that activates in the presence of light!



nanoDefense™ is the solution for your business touchpoints.

What is a Self-Cleaning surface?

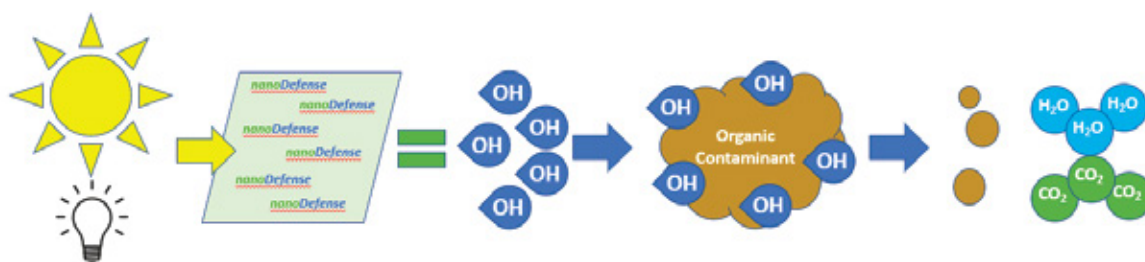
In its simplest form, a self-cleaning surface is one that has a mechanism to repel and/or destroy contaminants. In nature, Butterfly wings, Lotus leaves, and a Gecko's feet all are remarkable in their ability to repel contaminants. **nanoDefense™** is a super hydrophilic surface that repels contaminants allowing it to easily be wiped clean with water, but more importantly, its patented ingredients are actively involved in destroying organic compounds on a molecular level.

The nanoScience of Clean = the power of Nature

The incredible power of **nanoDefense™** is a natural process called photocatalysis. Earth's atmosphere relies on a remarkable, natural process to destroy toxins and cleanse the air we breathe. The photocatalytic properties of **nanoDefense™** create hydroxyl radicals and superoxide anion radicals that are members of nature's cleaning crew.

The **nanoDefense™** product uses the naturally occurring mineral of Titanium Dioxide (TiO₂) in nanoparticle form to create an active surface that is photocatalytic. When exposed to light, a natural reaction occurs that breaks down contaminants at a molecular level. This process actually pierces the cell walls of contaminants and decomposes them into harmless byproducts. While it sounds miraculous, it is all natural, safe, and effective. Used in hospitals and the medical industry, it is a well-studied phenomenon that is a non-toxic, safe solution for helping to keep surfaces clean. First discovered over 35 years ago, the oxidizing power created by titanium dioxide initiated photocatalysis is actually more than twice as powerful as bleach! This active process happens continuously in the presence of light which means that surfaces covered by **nanoDefense™** are working to protect your customers and employees.

There is a wealth of independent research over the past 20 years that support the amazing characteristics of Titanium Dioxide nanoparticles and the power of photocatalysis. **nanoDefense™** uses proven science to bring a new, safe, and effective solution for touch points that will show your customers and employees that you care about them!



How is nanoDefense better?

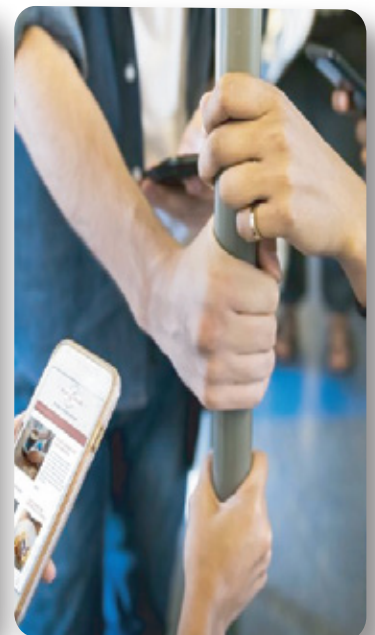
The technology of TiO₂ induced photocatalysis is proven effective. **nanoDefense™** uses a proprietary, patented formulation that is in fact superior to comparable coatings. First and most importantly, the molecular construction is engineered to reflect light at peak efficiency. This means increased photocatalytic activity, especially in indoor lighting. Secondly, it is formulated to have a coating that is dispersed evenly so that 100% of the surface is protected. And it also has additives that increase its abrasion resistance, resulting in longer lasting effectiveness!

Professional Grade products are intended for low to medium traffic environments such as offices, banks, and similar professional atmospheres. This product is easily recognizable by its green color



INDUSTRIAL GRADE

products are intended for extreme environments, such as Airports, Masstransit, and other high traffic public spaces.



Common Touch Points

Facility Rest Rooms



Buttons



Touch Screens



Self Service Items



Common Touch Points

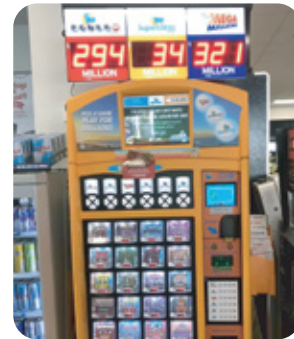
Utility

Mobility



Mass Transit

Vending/Kiosk



Professional Grade Indoor Products

Push Bars (Assorted materials available)

Professional Grade Indoor - Woven Fabric - Size 17.25 x 3.6
Part Number 90.00031
(Sold in Packs of 25)

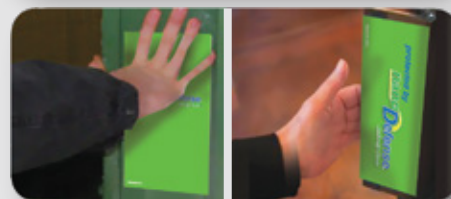
Professional Grade Indoor - Woven Fabric - Size 11.875 x 3.43
Part Number 90.00032
(Sold in Packs of 25)



Push Pads (Assorted materials available)

Professional Grade Indoor - Woven Fabric - Size 8.625 x 3.75
Part Number 90.00027
(Sold in Packs of 25)

Professional Grade Indoor - Woven Fabric - Size 5.875 x 8.625
Part Number 90.00026
(Sold in Packs of 25)

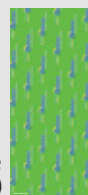
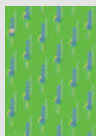
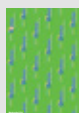


Handle Wraps (Assorted materials available)

Professional Grade Indoor - Woven Fabric - Size 2.875 x 4.00
Part Number 90.00029
(Sold in Packs of 25)

Professional Grade Indoor - Woven Fabric - Size 4 x 5.875
Part Number 90.00030
(Sold in Packs of 25)

Professional Grade Indoor - Woven Fabric - Size 3.75 x 8.625
Part Number 90.00028
(Sold in Packs of 25)



INDUSTRIAL Grade Indoor Products

Push Bars (Assorted materials available)

Industrial Grade Indoor - Woven Fabric - Size 17.25 x 3.6
Part Number 90.00018
(Sold in Packs of 25)

Industrial Grade Indoor - Woven Fabric - Size 11.875 x 3.43
Part Number 90.00017
(Sold in Packs of 25)



Push Pads (Assorted materials available)

Industrial Grade Indoor - Woven Fabric - Size 8.625 x 3.75
Part Number 90.00013
(Sold in Packs of 25)

Industrial Grade Indoor - Woven Fabric - Size 5.875 x 8.625
Part Number 90.00012
(Sold in Packs of 25)

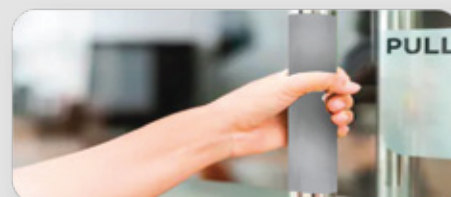
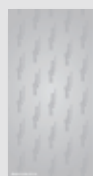


Handle Wraps (Assorted materials available)

Industrial Grade Indoor - Woven Fabric - Size 2.875 x 4.00
Part Number 90.00015
(Sold in Packs of 25)

Industrial Grade Indoor - Woven Fabric - Size 4 x 5.875
Part Number 90.00016
(Sold in Packs of 25)

Industrial Grade Indoor - Woven Fabric - Size 3.75 x 8.625
Part Number 90.00014
(Sold in Packs of 25)

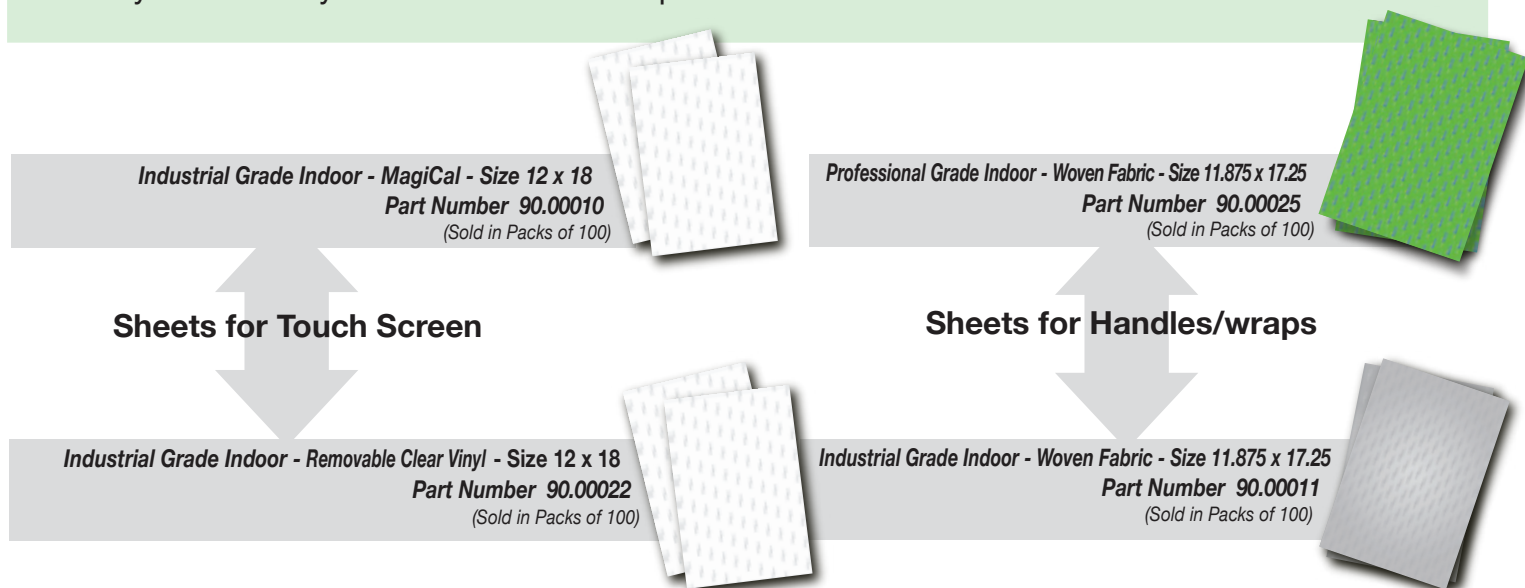


Custom Sizes and Colors Available - Subject to a minimum order quantity of 10,000 sq. ft. of material

DIY Master Sheets

DIY sheets allow printers, fabricators and end users to make their own custom parts for their own specific markets and market segments. Many variations of materials Available.

Ready To Use Films Die cut, plot cut, kiss cut even scissor cut. Master sheets that allow you to make your own custom sized parts.



Printable Films 2nd surface printable clear substrates that allow a myriad of possibilities. Print Ready for HP Indigo's, Screen Print and UV digital Inkjet systems.

Professional Grade

Printable Sheets - Size -12 x 18
Professional Grade Outdoor - .007 8B35 Polycarbonate
Part Number 90.00024
(Sold in Packs of 100)

(Various Thicknesses and Textures Available)



INDUSTRIAL GRADE Products

Printable Sheets - Size -12 x 18
Industrial Grade Outdoor - .007 8B35 Polycarbonate
Part Number 90.00009
(Sold in Packs of 100)

(Various Thicknesses and Textures Available)



Custom Sizes and Colors Available - Subject to a minimum order quantity of 10,000 sq. ft. of material

Overview:

nanoDefense™ is a device containing a photocatalytic coating that breaks down (VOC's), odors, airborne pollutants and generates a hydrophilic self-cleaning surface. **nanoDefense™** combines photocatalytic TiO₂ and advances in nanotechnology to create the most advanced light-activated functional product on the market.



nanoDefense™

Surface Protection

IDEAL FOR PREVENTING THE GROWTH AND SPREAD OF BACTERIA THROUGH COMMON TOUCH POINTS.

IDEAL FOR USE IN AREAS WHERE HYGIENE IS OF PARTICULAR IMPORTANCE, SUCH AS HOSPITAL AND HEALTHCARE ENVIRONMENTS, SCHOOLS, NURSERIES, RETAIL ENVIRONMENTS, COMMUNAL BUILDINGS, RESTAURANTS, CAFETERIAS AND VENDING APPLICATIONS

Uses:

Air and Surface cleaning in:

- Schools
- Hospitals
- Hotels
- Airports
- Restaurants
- Public Infrastructure
- Public Transportation
- Offices
- Shopping Centers

Features:

- *Creates a hydrophilic, self cleaning surface that produces Hydroxyl Radicals with 2 times the oxidizing power of bleach.*
- *Reduces the use of harsh cleaning chemicals.*
- *Reduce maintenance cycles.*

DEVICE CHARACTERISTICS

Outdoor Durability/UV Protection	High
Chemical Resistance	Excellent resistance to many household cleaners
Photocatalytic properties	5 Years
Shelf Life	2 years for adhesive backed 5 years for non-adhesive backed

Independent Lab Test Results

Photocatalytic Activity

Description	Contaminants	Class	Test Results	Method
nanoDefense™	—	—	Pass	ISO22197-1-2007
	—	—	Pass	ISO22197-2-2011
	—	—	Pass	ISO22197-3-2011

Air Purification

Description	Contaminants	Class	Test Results	Method
nanoDefense™	Toluene	Air	Pass	JIS-R 1701-3
	Acetaldehyde	Air	Pass	JIS-R 1701-2
	Formaldehyde	Air	Pass	JIS-R 1701-4
	SO2	Air	Pass	UTISH
	NO2	Air	Pass	ERCA

Bacteria & Virus

Description	Contaminants	Class	Test Results	% Reduction	Method
nanoDefense™	Covid 19	Virus	Pass	99.96	PCR
	SARS-Cov	Virus	Pass	99.96	PCR
	MERS-Cov	Virus	Pass	99.96	PCR
	Influenza A/B	Virus	Pass	99.96	PCR
	H1N1	Virus	Pass	99.96	PCR
	Staphylococcus Aureus (MRSA)	Bacteria	Pass	99.97	AATCC-100
	Klebsiella Pneumonia	Bacteria	Pass	99.96	AATCC-100
	Streptococcus agalactiae	Bacteria	Pass	99.96	PCR
	Salmonella	Bacteria	Pass	99.96	PCR
	MRSA	Bacteria	Pass	99.96	PCR
	Coliform Bacteria(Ecol)	Bacteria	Pass	99.96	PCR

Artificial Weathering

Description	Test	Test Results	Method
nanoDefense™	UV Exposure	Pass	ASTMG154
	Resistance to Humidity	Pass	ASTMD4585
	Chemical Resistance	Pass	ASTMD1308

These test results are not transferable and may not be relevant or applicable to real life applications. Therefore, we strongly recommend other regulatory entities may require additional testing to determine the suitability for any specific end application. Though there are a number of peer reviewed papers on Titanium Dioxide's ability to kill bacteria and viruses, nanoDefense™ is not registered with the EPA as a pesticide and therefore can make no claims that it is antimicrobial to the general public.

What is the product intended to do?

nanoDefense™ is a recognizable, replaceable substrate that has a proprietary coating on it that in the presence of light is activated and begins the self-cleaning process. It is intended to be put onto high touch surfaces in lighted areas to provide a surface that is continuously working to remove contaminants.

How does the **nanoDefense™** Surface work?

One of the components of the surface is a mineral called titanium dioxide. Titanium dioxide acts as a catalyst, charged by light. These nano-crystals create an oxidation reaction that has 2 times the oxidation power of bleach. This oxidation reaction breaks down organic material at the molecular level and converts it into base components such as CO₂.

What do you mean by "self-cleaning"?

The **nanoDefense™** surface continuously oxidizes organic contaminants at the molecular level. Light must be able to meet the surface for it to work. For example, if the surface is covered with mud or other large-scale contaminants, they must be removed to allow the surface to do its job. This is like disinfectants, which require surfaces to be cleaned before the disinfectant can be effective.

How should I clean **nanoDefense™** surfaces?

nanoDefense™ surfaces are not affected by traditional nonabrasive surface cleaners or detergents. We recommend wiping the surface with a nonabrasive cloth and water to remove large-scale contaminants. Do not use harsh cleaners, detergents, or abrasive cleaning utensils that will compromise the coated surface.

How do I choose between industrial grade or professional grade?

All facilities have areas within them that get touched or used more frequently than others. While individually these areas are more susceptible to wear, the facility itself may have high traffic compared to another location that has the same exact touch points and needs the same protection. By utilizing preventative practices as a part of your daily, weekly, monthly, quarterly sanitation process you will become in tune with the wear of the product and the need to replace it more frequently or utilize one grade over the other. Industrial grade Nanodefense products are intended for higher traffic areas. Professional grade **nanoDefense™** product are intended for low to medium traffic areas

How long do **nanoDefense™** products last?

We recommend replacing **nanoDefense™** products quarterly at a minimum. Some areas get more traffic or touches than others and because of that **nanoDefense™** has two grades, Industrial and professional. Industrial is intended to be used in high traffic applications, and the professional grade product is intended for lesser used areas. The **nanoDefense™** surface can never be used up or expire, so the products surface has a shelf life that is virtually unlimited. The Products service life is solely dependent on whether the surface is still present due to actual physical wear.

How do I know when to replace **nanoDefense™** surfaces?

The easiest rule to follow is to replace **nanoDefense™** quarterly at a minimum. However, the print serves as a wear indicator, so if the text or graphics become worn or faded, it's time to replace, as the coated surface that exists on top of the print no longer exists. Also, if **nanoDefense™** starts to peel off, we recommend replacement to keep the touch point from allowing contaminants from harboring behind the part where it is not active.