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Bra, 30 September 2016

## **FENIX NTM® AND NANOTECHNOLOGY**

Arpa Industriale has created FENIX NTM: a new product that has been developed for outstanding interior design.

Fenix NTM has low light reflectivity, an extremely matt surface with anti-fingerprint, pleasant soft touch, intensity and colour depth, but also enhanced scratch and abrasion resistance and thermal healing of superficial damages.

Some of the features are achieved by using nanotechnology in combination with acrylic coating that allows nanomaterial in the coating to be integrated and fixed in the surface décor layer of FENIX NTM after completion of the curing process.

The substance of which nanomaterial is made is registered, evaluated and authorized under the applicable regulation (REACH) and according to the notifications provided under the regulation no hazards have been classified. The substance of which nanomaterial is made is commonly found in nature, in food and in a wide range of applications.

The usual safety requirements of fabrication and machining of panels should be observed. Make sure that there is adequate ventilation and avoid breathing dust, fumes, or gas. Also, wear eye and face protection and protective gloves. Wash hands and skin following contact. If the material is ingested, clean the mouth with water. If the material gets into the eyes, rinse eyes thoroughly with water.

This information is provided to the best of knowledge and information at the date below. It is intended to give general information about the product.

September 2016

## **FENIX NTM® OG NANOTEKNOLOGI**

Arpa Industriale har udviklet FENIX NTM: et nyt produkt, som er fremstillet til enestående interiør design.

FENIX NTM har lav lysreflektion, en ekstrem mat overflade med fingeraftryks-afvisning, behagelig soft touch, intensitet og farvedybde, men også forbedret modstandsdygtighed over for ridser og slitage samtidig med at det er muligt med varme at reparere micro ridser i overfladen.

Nogle af egenskaberne opnås ved anvendelse af nanoteknologi i kombination med en akrylbelægning, som sørger for at nanomaterialet bliver en integreret del af belægningen og dermed fastholdt i det øverste dekorlag af FENIX NTM når hærdningsprocessen er overstået.

Det stof, som nanomaterialet er lavet af, er registreret, undersøgt og autoriseret under den gældende norm (REACH) og i henhold til de notifikationer der findes under denne norm, er der ikke klassificeret farlige stoffer.

Stoffet, som nanomateriale er lavet af, findes naturligt i naturen, i mad og anvendes mange steder. De normale sikkerhedskrav ved fabrikation og bearbejdning af plader skal følges. Sørg for at der er tilstrækkelig ventilation og undgå indånding af støv, dampe eller gasser. Brug øjen- og ansigtssvævn samt beskyttelseshandsker. Vask hænder og hud efter kontakt. Hvis materialet kommer ind i munden, renses munden med vand. Hvis materialet kommer i øjnene, renses øjnene grundigt med vand.

Denne information er givet ud fra den tilgængelige viden og information på den nedenfor anførte dato. Formålet er at give en generel information om produktet.

September 2016

This data sheet describes the composition of FENIX NTM<sup>®</sup> and provides advice for the handling, processing, use and disposal of the material. It covers all FENIX NTM grades (thin and solid). FENIX NTM is not classified as a hazardous material and therefore it does not require a special labelling nor a safety information sheet

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**0. Producer Company name**

ARPA INDUSTRIALE S.P.A

Via G. Piumati, 91, 12042 Bra (CN) Italia

Tel. +39 0172 436111,

Fax +39 0172 431151.

**1. Description / Composition**

FENIX NTM is an innovative material created for interior design by Arpa Industriale. It is produced by the simultaneous application of heat (approx. 150 °C) and high specific pressure (> 7 MPa) in order to have a homogeneous non-porous high density product.

The core structure of FENIX NTM is composed of paper impregnated with thermosetting resins. Its external surface involves the use of nanotechnology and its decor is obtained through next generation resins developed thanks to Arpa Industriale's research.

Basically more than 60% of FENIX NTM consists of paper, while the remaining 30 to 40% consists of cured resins for core and surface layers.

70% of the FENIX NTM manufacturing process results from high pressure thermo-lamination; 30% implies the use of nanotechnologies and processes developed exclusively by Arpa Industriale. These processes involve the use of next generation resins, nanotechnology and EB curing.

FENIX NTM is supplied in the form of sheets in a variety of sizes, thickness and an extremely matt surface.

**2. Storage and transportation**

FENIX NTM is classified as a non hazardous product and therefore it does not require any special labeling or identification during storage or during transportation.

It is recommended to store it on a planar surface (e.g. pallet) in dry and ventilated areas.

Although FENIX NTM is not a flammable material, its storage represents a fire load. Therefore prevention and fire protection measures provided for wood-based materials apply.

**3. Handling and machining**

Security measures must be taken during the machining in accordance to the current local legislation with regard to dust extraction, dust collection and fire precautions. In particular, refer to regulations applicable to wood-based materials processing (cutting, sanding, etc.).

The FENIX NTM powder is inert. During processing, security measures to monitor workers exposure to this kind of dust are applicable.

Because of the possible presence of sharp edges, protective gloves should always be worn when handling the material.

**4. Environmental and Health Aspects in Use**

FENIX NTM's surface is cured and therefore chemically inert.

The volatile organic compounds emissions from the FENIX NTM surface and its core are limited and close to the analytical devices' detectable limit. FENIX NTM formaldehyde emission level is far below the limit for wood-based materials.

Due to its low permeability, FENIX NTM applied to wood-based substrates act as a barrier against possible formaldehyde emissions generated from the substrates.

FENIX NTM is approved for contact with food since there is no substance migration from the material.

The decorative surfaces are resistant to common household solvents and chemicals .

The non porous FENIX NTM surface and edges are easy to disinfect with hot

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water, steam and all types of disinfectants used in hospitals and other commercial facilities.

### **Nanotechnology production on FENIX NTM**

The nanoparticles used for FENIX NTM have an amorphous and non-crystalline structure.

They have a nanometric dimension of less than 100 nm and are not visible to the naked eye.

These nanoparticles are homogeneously dispersed and evenly embedded the FENIX NTM coating.

By oral uptake, they are not toxic.

The scientific and medical literature to date shows no correlation between respiratory symptoms, functional parameters of the lungs, skin or mouth and the nanoparticles used for FENIX NTM.

Additionally, no negative effects on humans have been yet observed after decades of experience with their industrial production and application. The examination under an electron microscope of the saw dust from milling, drilling, sanding and grinding of FENIX NTM sheets only shows micron-scale particles, larger than the original nanoparticles.

Nanoparticles of silver and titanium dioxide, as well as nanotubes and nanofibers of carbon and asbestos, are not used.

### **5. Maintenance**

FENIX NTM does not suffer from corrosion and oxidation. Therefore, it does not need any further surface protection (lacquers or paints).

### **6. FENIX NTM in fire situations**

FENIX NTM is difficult to ignite and has properties that retard the "spread of flame," thus prolonging the evacuating time.

In case of incomplete burning, as with any organic material, hazardous substances are to be found in the smoke

### **7. Energy recovery**

Because of its high calorific value (18 to 20 MJ/kg)\* FENIX NTM is ideal for thermal recycling, which should only be done through specially authorized plants.

When burnt completely at 700°C, FENIX NTM produces water, carbon dioxide and nitrogen oxide.

\* For comparison: Calorific value of oil = 37 to 41 MJ/kg, and of hard coal = 28 to 31 MJ/kg.

### **8. Waste disposal**

FENIX NTM refuses are non-hazardous waste and must be disposed according to the current national and/or regional regulations.

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## 9. Technical data

### 9.1 Physical/chemical characteristics

9.1.1	Physical state	Solid sheets
9.1.2	Density	$\geq 1.35 \text{ g/cm}^3$
9.1.3	Solubility	Insoluble in water, oil, methanol <sup>®</sup> , diethyl ether, n-octanol, acetone
9.1.4	Boiling point	None
9.1.5	Evaporation rate	None
9.1.6.	Melting point	FENIX NTM do not melt
9.1.7	Calorific value	18 - 20 MJ / Kg
9.1.8	Heavy metals	FENIX NTM does not contain compounds of antimony, barium, cadmium, chromium <sup>III</sup> , chromium <sup>VI</sup> , lead, mercury, selenium.

### 9.2 Stability and reactivity data

9.2.1	Stability	FENIX NTM is stable; it is not considered reactive or corrosive.
9.2.2	Hazardous reactions	None
9.2.3	Material incompatibility	Strong acids or alkaline solutions will stain the surface.

### 9.3 Fire and explosion data

9.3.1	Ignition temperature	Approx. 400 °C.
9.3.2	Flash point	None
9.3.3	Thermal decomposition	Possible above 250 °C. Depending on the burning conditions (temperature, amount of oxygen, etc.) toxic gases may be emitted, e. g. carbon monoxide, carbon dioxide, ammonia.
9.3.4	Flammability	FENIX NTM is not considered to be flammable. It will burn only in a fire situation, in presence of open flames.
9.3.5	Extinguishing media	FENIX NTM is considered a class A material. Carbon dioxide, water spray, dry chemical foam can be used to extinguish flames. Water dampens and prevents rekindling. Persons in fire situations should wear self breathing apparatus and fire protective clothing.
9.3.6	Explosion hazards	The machining, sawing, sanding and routing of FENIX NTM produce ST-1 dust class. Safety precautions and adequate ventilation must be observed to avoid airborne dust concentration.
9.3.7	Explosion limits	Dust levels should be kept below $60 \text{ mg/m}^3$ .
9.3.8	Protection against explosion and fire	Follow the same measures and regulations provided for wood-based materials.

### 9.4 Electrostatic behaviour

FENIX NTM minimizes the generation of electrostatic charge by the contact, separation or rubbing with another material. It does not need to be earthed. Because its surface resistivity is between  $10^9 - 10^{12}$  ohms and its chargeability of  $V < 2 \text{ kV}$ , according to CEI IEC 1340-4- 1, FENIX NTM is an antistatic material.



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<b>9.5</b>	<b>Storage and transport</b>	FENIX NTM is classified as non-hazardous for transportation purposes and there are no specific requirements.
<b>9.6</b>	<b>Machining</b>	Use gloves to protect from sharp edges and safety glasses to prevent eye injuries. No special working equipment is necessary, except protections to minimize dust exposure in case of sheet machining.
<b>9.7</b>	<b>Disposal considerations</b>	Waste material should be handled according to local regulations. Burning is permitted in authorized industrial incinerators.
<b>9.8</b>	<b>Health information</b>	FENIX NTM is not considered to be dangerous for humans and animals. There is no evidence of FENIX NTM toxicological effects and eco- toxicity. FENIX NTM surfaces are physiologically safe and approved for use in contact with food, according to EN 1186 and CEE 310 14.12.1993.
9.8.1	Working areas	General dust regulations are applicable.
9.8.2	Formaldehyde emission	< 0.4 mg/h m <sup>2</sup> (tested according to EN 717-2) < 0.05 ppm (tested according to the WKI chamber method)
9.8.3	Pentachlorophenol	FENIX NTM does not contain PCP (Pentachlorophenol).
<b>9.9</b>	<b>Additional remarks</b>	FENIX NTM is presented in solid sheets and there are not any health hazards associated with them.

*All information reported here are based on the current state of technical knowledge, are purely descriptive and do not constitute any form of guarantee. It is the personal responsibility of the user of the products described in this information leaflet to comply with the appropriate laws and regulations.*

This technical sheet was issued on the basis of the analogous document by International Committee of Decorative Laminates Industries (ICDLI) located in Frankfurt am Main, web site: [www.icdli.com](http://www.icdli.com).  
ARPA Industriale is an ICDLI member.

# CERTIFICATE OF COMPLIANCE



**Arpa Industriale SpA**  
**FENIX NTM**

62295-410

Certificate Number

11/29/2010 - 11/29/2016

Certificate Period

Certified

Status

UL 2818 - 2013 Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Products tested in accordance with UL 2821 test method to show compliance to emission limits in UL 2818, Section 7.1.



**Environment**

UL Environment investigated representative samples of the identified Product(s) to the identified Standard(s) or other requirements in accordance with the agreements and any applicable program service terms in place between UL Environment and the Certificate Holder (collectively "Agreement"). The Certificate Holder is authorized to use the UL Environment Mark for the identified Product(s) manufactured at the production site(s) covered by the ULE Test Report, in accordance with the terms of the Agreement. This Certificate is valid for the identified dates unless there is non-compliance with the Agreement.

## GREENGUARD Certification Criteria for Building Products and Interior Finishes

Criteria	CAS Number	Maximum Allowable Predicted Concentration	Units
TVOC <sup>(A)</sup>	-	0.50	mg/m <sup>3</sup>
Formaldehyde	50-00-0	61.3 (50 ppb)	µg/m <sup>3</sup>
Total Aldehydes <sup>(B)</sup>	-	0.10	ppm
Particle Matter less than 10 µm <sup>(C)</sup>	-	50	µg/m <sup>3</sup>
4-Phenylcyclohexene	4994-16-5	6.5	µg/m <sup>3</sup>
Individual VOCs <sup>(D)</sup>	-	1/10th TLV	-

- (A) Defined to be the total response of measured VOCs falling within the C<sub>6</sub> – C<sub>16</sub> range, with responses calibrated to a toluene surrogate.
- (B) The sum of all measured normal aldehydes from formaldehyde through nonanal, plus benzaldehyde, individually calibrated to a compound specific standard. Heptanal through nonanal are measured via TD/GC/MS analysis and the remaining aldehydes are measured using HPLC/UV analysis.
- (C) Particle emission requirement only applicable to HVAC Duct Products with exposed surface area in air streams (a forced air test with specific test method) and for wood finishing (sanding) systems.
- (D) Allowable levels for chemicals not listed are derived from 1/10th of the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, and Cincinnati, OH 45211-4438).



**Environment**