

## Product information: TECNADIS METALCOAT EASY TO CLEAN

### Protective coating with hydrophobic and oleophobic properties

#### DESCRIPTION

TECNADIS METALCOAT EASY TO CLEAN coating includes the following features:

- It is a **bi-product coating** consisting on the followings (See "How To Use" sheet for more information):
  - TECNADIS METALCOAT BASE or TECNADIS METALCOAT PLUS: Primer that provides adhesion to the surface and the durability to the final product. It also consists in two different components (Component BASE & Component ACTIVATOR) that should be mixed before application to elongate liquid product's lifetime.
  - TECNADIS METALCOAT ENHANCER: Finish which maximises functionalities.
- It is an innovative **permanent coating** for protecting the surfaces and for providing an easy cleaning.
- It is based on a ceramic nanoparticles dispersion, which transforms the surface where it is applied into an **anti-adherence surface** with easy to clean properties.
- It creates a **colourless film**, keeping the natural colour of the substrate and not generating shines, and **protecting it against external agents** like environment or other corrosive agents.
- Coating final thickness varies from **2 to 4 microns**, depending on the application method.

#### BENEFITS

TECNADIS METALCOAT EASY TO CLEAN coating provides the following benefits:

- It is **directly applicable over a wide variety of surfaces** such as iron, steel, aluminium, copper, bronze, brass, enamelled metals, etc., as well as ceramics materials.
- It does **not modify at all the natural aspect, colour and structure** of the surface onto it is applied.
- It **acts as a barrier**, preventing the sticking of stain to the surface onto where it has been applied, as well as it protects against external agents that might make serious damages on the surface. Its composition with hydrophobic and oleophobic properties facilitates the removal of aqueous or organic materials through the treated surface.
- **High heat shock resistance** even at temperatures higher than 350°C. It keeps the appearance of the surface and its cleaning properties above 400°C in continuous operation and even peaks of higher temperatures.
- It presents **good resistance to acids, basics, solvents and common cleaning products**.
- **There is not migration risk**. It fulfils current legislation on materials and objects to be in contact with food in agreement with Directive 2005/31/CE and Regulation 1935/2004. In addition, it complies with the US test. FDA (CPG 7117.06 & 7117.07) and the English company InS Services have certified Tecnadis METALCOAT "Easy To Clean", as R1 with No. 1805038, as a coating intended for food contact.
- **Easy to apply**. Its application can be performed through common coating or painting techniques such as spraying with a commercial gun or by dip-coating.
- It is a **permanent film**, maintaining its easy to clean properties for more than 30 temperature cycles of heat shocks at 350°C and 30.000 abrasion cycles. The active components do not react with the treated surface, thereof avoiding possible degradations.
- Its final **thickness (2 - 4 microns** depending on application method) is negligible when comparing to usual mechanical tolerances in manufacturing and/or transforming.
- **It is possible to repair the coating in damaged areas and even a complete reapplication** of the TECNADIS METALCOAT ENHANCER without removing the remains of the previous coating. If necessary, it can be removed polishing the treated surface.
- In industrial environments, it provides **non-stick properties** that make easy the surfaces cleaning avoiding deposits and incrustations, as well as it facilitates the transport of fluids through pipes and pipelines reducing pumping's energy consumption. It also **protects from external agents** that could damage the structure of the treated material. Thanks to its non-stick properties, **simplifies the cleaning process** by reducing the amount of resources (water, energy and cleaning products), and even avoiding the use of abrasives and descaling that may damage the surface.

## COMPOSITION

- TECNADIS METALCOAT EASY TO CLEAN is based on a dispersion of ceramic nanoparticles.
- Other active agents are added in a concentration ranging from 35 to 45% wt. approx.
- This product is in an alcoholic base (ethanol).

## APPLICATIONS

TECNADIS METALCOAT EASY TO CLEAN coating may be directly applied onto any metallic surface such as steel, iron, aluminum, copper, bronze, brass and enameled steels, among others, and also onto ceramic materials, varnished surfaces, and others.

## PHYSICO-CHEMICAL PROPERTIES

- |                     |              |
|---------------------|--------------|
| • Colour            | Colourless   |
| • Active Components | 35 - 45% wt. |
| • Solvent           | Ethanol      |
| • Density           | 0,899 g/ml   |
| • Boiling point     | 78 °C        |
| • Flashpoint        | 9 °C         |
| • pH value          | 1,5 - 2      |

## HOW TO USE

Steps to follow for a complete application of TECNADIS METALCOAT EASY TO CLEAN:

1. **PREPARING THE SURFACE:** The surface must be clean and dry before the application. Avoid presence of dust or any other solid particles on the surface. To degrease the surface with alcohol and to dry with a cloth or air is recommended before the application of the TECNADIS METALCOAT BASE/PLUS to remove any dirt, fats, oil, water, cleaners or cleaning products.
2. **PREPARATION OF TECNADIS METALCOAT BASE or PLUS. MIXTURE OF COMPONENT BASE AND ACTIVATOR.** Tecnadis METALCOAT BASE and PLUS have been designed in 4:1 proportion in the case of use all the product to add the whole content of Component ACTIVATOR into the container of the Component BASE. To prepare the mixture, add the whole content of Component ACTIVATOR into the container of the Component BASE, close and shake it to ensure product's mixture. Shearing forces are not required to achieve good mixing.

Once both components have been mixed, an increase in temperature is made as indicative of the chemical reaction is taking place. For this reason, it is recommended to wait 5-10 minutes before applying it onto the surface once the mixture is made.

Once the mixture is made, the final product is stable during 30 days approximately. After this time, the mixture should be discarded and it is recommendable to prepare a new mixture to ensure a correct performance. For mixtures previously prepared, stir the product before application.

3. **TECNADIS METALCOAT BASE/PLUS APPLICATION:** Apply homogeneously the prepared mixture over the surface in a single layer, avoiding possible excesses and product's sags. Approximated performance: 45-55 ml/m<sup>2</sup> depending on surface's nature porosity and roughness.

It is better to apply less amount than an excess, since that could end in a brittle white-colour-coating after drying which will be easily detached from the surface as flakes. If the product drains after its application, use the air of the gun or a cloth to dry and spread it out uniformly along the surface (with one pass is enough).

The application of the METALCOAT BASE/PLUS products can be performed by different techniques taking into account morphology, dimensions and end-use of the pieces to be treated. For small pieces, the dip-coating method is recommended, which consists in immersing the piece into the liquid during a minute and then draining excess. For larger pieces with good accessibility, application by a compressed-air-powered-spray-gun like the type of "TransTech" or by an electric airless painting gun is advisable. For applications in industrial series is better to use a robotic arm system to spray the product.

4. **CURING OF THE TECNADIS METALCOAT BASE/PLUS:** After deposition of TECNADIS METALCOAT BASE/PLUS, wait few minutes to evaporate the solvent. Then, the product needs a thermal drying at 100°C until all the solvent has been evaporated and the coating has not longer wet look. Several thermal devices can be used to this aim, namely ovens for small pieces and industrial line productions, or thermal portable devices such as thermal guns or cannons for in-situ applications in already-existing lines. The recommended duration for this process should be between 15-30 minutes.

For the last step to fix the coating to the surface, it is necessary a thermal sintering at 300°C during 15-30 minutes, depending on the piece to be treated and the thermal device used, that can be the same as used for the before step.

Important: Direct contact with the heat focus and hot supports must be avoided since a strong thermal shock at this point may cause a too fast drying, ending in a whitish and brittle coating.

5. **COOLING THE SURFACE:** Wait to cool the surface during 2-5 minutes before to apply the TECNADIS METALCOAT ENHANCER. It is not recommendable to apply this second layer with the surface hot because the product can evaporate and it cannot stick it on the surface.
6. **TECNADIS METALCOAT ENHANCER APPLICATION:** This product is applied by dip-coating or spraying with a compressed-air-gun "TransTech" type or by a robotic arm system as in the case before. If the same air-gun is used for the two products, it is recommendable to clean it with a solvent in order to not contaminate the liquids. The approximated performance is 60-70 ml/m<sup>2</sup>.

The aspect of the coating should not be altered by the deposition of this top layer. For this reason, a very fast spraying will be used for the deposition preferably. Although it seems that nothing has been applied, the enhancer product has been already deposited. Avoid excess product. If this occurs, use a cloth to dry and spread it uniformly along the surface.

7. **CURING OF THE TECNADIS METALCOAT ENHANCER:** The Tecnadis METALCOAT ENHANCER needs a thermal drying to ensure a proper fixation of the product over the before product, Tecnadis METALCOAT BASE or METALCOAT PLUS. Several thermal devices can be used such as thermal gun or other thermal systems like ovens, and it needs a thermal drying at 200°C during 15-30 minutes over the treated surface.

## HANDLING PRECAUTIONS

Product safety information required for safe use is not included in this document. Before handling, read material safety data sheets and container labels for safe use, physical, and health hazard information. Material safety data sheet (MSDS) is available from Tecnan S. L.

## USAGE LIFE AN STORAGE

Storage well closed in the original hermetic container between 5°C y 30°C of temperature.

Avoid direct sunlight and keep away from heat and open flames and avoid freezing.

The material contained may settle slowly, so it is recommended an adequate agitation before use.

Each of the 3 individual components that make up the solution TECNADIS METALCAOAT EASY TO CLEAN has a shelf life of 12 months since the manufacture's date. It is not recommended the use of the mixture of the two components, BASE and ACTIVATOR, that are used for the product Tecnadis METALCOAT BASE or PLUS.

## LIMITATIONS

It is recommended to make an initial test of the application on a small area of the material to be treated in order to verify the correct application of the product.

Apply in temperatures between 5°C and 30°C (recommended).

This product is not suitable for medical or pharmaceutical uses.

### Limited warranty information – Please read carefully

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