

TITAN CARE® TSR

TECHNICAL DATA SHEET V2.2 PRODUCT INFORMATION

ADVANCED NANO COMPOSITE MATERIAL APPLICATION



General Description

- green material, 100% non-toxic and environmentally-friendly
- easy to use, long lasting 24/7 basic functionality
- excellent heat resistant up 500°C
- tested by worldwide renowned authorities such as MICROBAC®, SGS and others

Features

- excellent self-cleaning & anti-dirt effect
- decomposes formaldehydes and VOCs
- highest air purification
- anti-odor
- perfect adhesion and durability on any material like automotive glass, excellent type of glass surfaces (PV-modules), decorative & crystal glass, glass facades & partitions, TV / display panels, metals like alloy, copper and stainless steel, marble and stone plates, ceramics and tiles, textiles and plastics, wood and latex formed finishes

Applications

as a protective and preventive measure in areas of

- health and medical
- food processing industries
- gastronomy and hotels
- merchandising and retail
- offices and public spaces
- OEM applications like glass, solar panel and window production, lighting and medical equipment, refinery and tank facilities, filter and industrial plant builders, wood industry,

Standard Packing

1kg bottle, 20kg/plastic drum & 200kg/plastic drum

Storage

Please store under room temperature 25 °C, humidity >45% with good ventilation and avoid exposure to direct

Typical Physical Properties

These properties are typical but should not be considered specifications.

	Item	Unit	Specification
			TitanCare® TSR
Property	Appearance	Visual	Light yellow solution
	Component	-	TiO ₂ SiO ₂ H ₂ O
	Solid Content	wt%	1.25~ 1.45
	Particle Size	nm	<100nm
	pH value	-	7.5~9.5
	Viscosity	25 °C mPa s	<5
	Reflectance	-	1.4~1.8
	Specific Gravity	25 °C	1.03
	Freezing Point	°C	4
Safety	Per oral Acute Toxicity	LD50(mg/kg. mouse)	>5000mg/kg
	Primary Skin Irritation	Primary irritation index	0

Reference Data

Item	Test Method	Unit	Result
Appearance	1)	Color difference	none
Decomposition Activity Index	TN-031	nmol/[L · min]	>5
Anti-Dirt	2)	ΔT %	<10%
Pencil Hardness	ASTM D3363-00	-	7H
Cross Cut	CNS10757	-	5B
Cross-Cut after dipping in boiled water	Dipping in boiled water (100 °C)/30minutes		5B
Transparency	3)	ΔT %	Refer below table
Reflectance	3)	ΔR %	Refer below table
Durability	CNS 10757	times	3000 times
Contact Angle	TN-031	degree	<10°

Methodology : Baking 30minutes at 400 °C after spraying 30g/m² on the glass.

1) Substrate: White glossy tile.

- 2) Methodology: a) Place coated and uncoated glass samples in talc, subject to 1kg weight for 1 minute.
b) Check the transparency of the glass samples (average value of 5 points)

Results: Transparency of uncoated sample declined by > 10%.

ΔT is the change rate of transparency

3) Transparency and reflectance will be depending on the processing method.

Comparison of quantity used

Item	Spray 10g/m ²	Spray 20g/m ²	Spray 30g/m ²	Dipping 1 time	Dipping 2 times	Dipping 3 times
Anti-dirt	✓	✓	✓	✓	✓	✓
Transparency (%)	88.36	87.70	87.56	89.76	90.21	90.94
Reflectance (%)	7.17	7.63	7.86	7.13	7.02	6.93

Methodology : 30 minutes Baking at 400 °C after spraying on the glass.

Average transparency of untreated glass : 88.987%

Dipping pull speed: 22.5mm/min

Comparison of Baking Temperatures

Item	Room Temp Day 1	Room Temp Day 3	Room Temp Day 10	Baking 100 °C	Baking 200 °C	Baking 300 °C	Baking 400 °C
Hardness	B	B	5H	3H	5H	6H	7H
Anti-dirt	✓	✓	✓	✓	✓	✓	✓
Durability of wiping with water ¹⁾	500	2000	2000	2000	2000	2000	2000
Durability of wiping with alcohol ²⁾	500	2000	2000	2000	2000	2000	2000

Methodology: Baking 30 minutes after spraying 30g/m² on the glass.

- 1) Test Method: Load 500g weight on the substrate and wipe with non-dust cloth with water.
No wrinkle, scratch, peeling allowed on the surface.

- 2) Test Method: Load 500g weight on the substrate and wipe by non-dust cloth with alcohol.
No wrinkle, scratch, peeling allowed on the surface.

Comparison of Baking Durations

Item	Baking 100 °C 15min	Baking 100 °C 30min	Baking 100 °C 60min	Baking 300 °C 15min	Baking 300 °C 30min	Baking 300 °C 60min
Anti-dirt	✓	✓	✓	✓	✓	✓
Hardness	2H	3H	6H	3H	6H	6H
Durability of wiping with water ¹⁾	2000	2000	2000	2000	2000	2000
Durability of wiping with alcohol ²⁾	2000	2000	2000	2000	2000	2000

Methodology: spraying 30g/m² on the glass.

- 1) Test Method: Load 500g weight on the substrate and wipe with non-dust cloth with water.
No wrinkle, scratch, peeling allowed on the surface.
- 2) Test Method: Load 500g weight on the substrate and wipe by non-dust cloth with alcohol.
No wrinkle, scratch, peeling allowed on the surface.

Super-Hydrophilicity

	Light 1min	Light 3min	Light 5min	Light 10min	Light 15min	Light 30min
Contact Angle (degree)	<10	<10	<10	<10	<10	<10

Methodology: 30 minutes baking at 400 °C after spraying 30g/m² on the glass.

Subject test specimens to UVA (1mW/ cm²) after keeping in a dark (non-litted) area for 1 week.

Super-Hydrophilicity (Duration at inert condition)

	1day	3day	5day	7day	14day
Contact Angle (degrees)	<10	<10	<10	<10	24

Methodology: 30 minutes baking at 400 °C after spraying 30g/m² on the glass.

Subject test specimens to UVA (1mW/ cm²) after keeping in a dark (non-litted) area for 1 week.

Recommended Application Process

1. Equipment

- a) Spraying: Spray gun, nozzle diameter 0.3~1mm, air pressure 0.3~3kg under room temperature 10~40 °C
- b) Dipping Method: Pulling speed: 25~150mm/min, solution temperature 25 °C

2. Process

- a) Ensure a thorough cleaning of the substrate surface.
- b) Apply Nano Coat after cleaned surface is dry.
 - Spraying: ensure minimum of 30 cm distance from the nozzle to the surface
 - Dipping: Baking temperature ~500 °C oven with hot air circulation.
- c) Ripening : Room temperature 24 hours
- d) Rinse equipment with water after application.

The data above is for reference only. Rubberized surfaces may require plasma treatment.

Please use the materials based on actual substrate & environment.

Safety & Notice

- 1. In order to ensure product reliability, please apply under clean environment.
- 2. Keep containers sealed after opening and store under recommended environment.
- 3. Minimum Storage temperature = 5°C, ensure good ventilation.
- 4. Precipitation and slight color change to light yellow is normal.
- 5. Please refer to Safety Data Sheet (SDS) for more details.

Product Stewardship

Scutum Nano Solutions GmbH encourages its customers to ensure that our products are not used in ways for which they are not intended or tested. Our personnel assist you to answer your questions and to provide reasonable technical support. Scutum Nano Solutions GmbH safety data sheets should be considered prior to use.

Disposal

Disposal according to official regulation, not contaminated and completely emptied packaging can be recycled.

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