

Characteristics	Test method	Tested Value	Required Value
Thickness	EN 438-2 section 5 HGS ⁽¹⁾ , CGS ⁽²⁾	According to the required thickness	0.9 ≤ t < 2.0 mm : ± 0.10 mm 2.0 ≤ t < 3.0 mm : ± 0.20 mm 3.0 ≤ t < 5.0 mm : ± 0.3 mm 5.0 ≤ t < 8.0 mm : ± 0.4 mm 8.0 ≤ t < 12.0 mm : ± 0.5 mm 12.0 ≤ t < 16.0 mm : ± 0.6 mm 16.0 ≤ t < 20.0 mm : ± 0.7 mm 20.0 ≤ t < 25.0 mm : ± 0.8 mm 25.0 ≤ t : According To Agreement customer / producer
Surface Quality	EN 438-2 Section 4		
	Dirt, spots & similar surface defects	≤ 2 mm ² /m ²	≤ 2 mm ² /m ²
	Fibers, hairs and scratches	≤ 20 mm/m ²	≤ 20 mm/m ²
Color Difference ⁽¹⁰⁾	ISO 7724	Uni Colors : ΔE ≤ 1.0 Printed Designs:	---
	Gentas Internal Standard ⁽¹¹⁾	No Visual Difference	---
Product Directionality	Simulated Daylight D65	Gentas ZERO PST might have a slight directionality that might effect the color tone and/or the light reflection when applicate in different directions. It is recommended to laminate ZERO in the same direction in order to avoid the slight color and/or reflection effect	---
Density	ISO 1183 - 1	1.4	Min. 1.35 gr/cm ³
Gloss Level @ 60°	ISO 2813	1.5	---
Wear Resistance	EN 438-2 section 10 HGS ⁽¹⁾ , CGS ⁽²⁾	IP = 433 Rev. Wear Value = 725 Rev.	Initial Point ≥ 150 Rev. Wear Value ≥ 350 Rev.
Scratch Resistance	EN 438-2 section 25 HGS ⁽¹⁾ , CGS ⁽²⁾	6 N	Flat Surface Min. 2 N
Micro Scratch Resistance	EN 16094-2012 Procedure B on Dark Color Procedure B on Light Color	MSR-B3 MSR-B1	---
Micro Scratch Thermal Healing ⁽⁷⁾	Gentas Internal test ⁽³⁾	Rating 5 ⁽⁴⁾	---
Resistance To Crazing (20 Hours @ 80°c)	EN 438-2 section 24 CGS ⁽²⁾	Level 4	Min. level 4

Characteristics	Test Method	Test Value	Required Value
Impact Resistance	EN 438-2 Small Ball section 20 HGS ⁽¹⁾ 0.9 ≤ t < 2.0	25 N	Min. 20 N
	Big Ball section 21 CGS ⁽²⁾ 2.0 ≤ t < 6.0 mm	No Crack , 4.5 mm	1400 mm height : no crack, 10 mm Max.
	t ≥ 6.0 mm	No Crack , 3.5 mm	1800 mm height : no crack, 10 mm Max.
Resistance To Craziing (20 Hours @ 80°C)	EN 438-2 section 24 CGS ⁽²⁾	Level 4	Min. level 4
Resistance to Dry Heat at 180°C	EN 438-2 section 16 HGS ⁽¹⁾ , CGS ⁽²⁾		
	Other Surface Finish	Level 5	Min. level 4
Resistance to Water Vapor	EN 438-2 section 14 HGS ⁽¹⁾ , CGS ⁽²⁾		
	Other Surface Finish	Level 5	Min. Level 4
Resistance to Immersion in boiling water	EN 438-2 section 12 HGS ⁽¹⁾	Level 5	Minimum Level 4
	CGS ⁽²⁾ Other Surface Finish	1.1% 0.3%	Max. 5% in weight Max. 2% in thickness
	Appearance	Level 4	Min. Level 4
Resistance to Cigarette Burn	EN 438-2 section 30 HGS ⁽¹⁾ , CGS ⁽²⁾	Level 4	Min. Level 3
Resistance to Chemicals	SEFA 8-1999	See attached Table	---
Resistance to Staining	EN 438-2 section 26 HGS ⁽¹⁾ , CGS ⁽²⁾		
	Group 1 + 2 Group 3	Level 5 Level 5	Min. level 5 Min. level 4
Resistance to Finger Print	Gentas Internal test ⁽⁵⁾	Rating 5 ⁽⁶⁾	---

Characteristics	Test Method	Test Value	Required Value
Flatness	EN 438-2 section 9 CGS ⁽²⁾		
	2.0 ≤ t < 6.0 mm	1.23 mm	Max. 8 mm / 1 M length
	6.0 ≤ t < 10.0 mm	1.46 mm	Max. 5 mm / 1 M length
	t ≥ 10.0 mm	1.87 mm	Max. 3 mm / 1 M length
Light fastness	EN 438-2 section 27 HGS ⁽¹⁾ , CGS ⁽²⁾		
	Grey Scale	Level 5	Min. level 4
Antibacterial Activity ⁽¹²⁾	ISO 22196 : 2011		
	Staphylococcus Aureus DSM 21979 ⁽¹³⁾ EDCC 5247	R(14) ≥ 4	R(14 , 15) ≥ 3.0
	Escherichia Coli DSM 1576 ⁽¹³⁾ ATCC 8739 ⁽¹⁶⁾ ISML CC 02/023	R(14) ≥ 4	R(14 , 15) ≥ 3.0
	Staphylococcus Epidermidis DSM 28764 ⁽¹³⁾ EDCC 5130	R(14) = 3.22	R(14 , 15) ≥ 3.0
Fire Classification(8)	EN 13501-1		
	6.0 ≤ t < 10 mm CGF	B s1 d0	B s2 d0
Dimensional stability at elevated temp. (70°C)	EN 438-2 section 17 CGS ⁽²⁾		
	2.0 ≤ t ≤ 5.0 mm	L : 0.22 mm W : 0.35 mm	L : Max. 0.4 mm W : Max. 0.8 mm
	t ≥ 5.0 mm	L : 0.18 mm W : 0.23 mm	L : Max. 0.3 mm W : Max. 0.6 mm
Tensile Strength	EN ISO 527 – 2 CGS ⁽²⁾	85 MPa	Min. 60 MPa
Flexural Strength	EN ISO 178 CGS ⁽²⁾	114 MPa	Min. 80 MPa
Flexural Modulus	EN ISO 178 CGS ⁽²⁾	16,522 MPa	Min. 9000 MPa

Characteristics	Test Method	Test Value	Required Value
Coefficient Of Linear Thermal Expansion (COTE)	ASTM D696-08 ⁽³⁾ CGS ⁽²⁾ 6 mm	6.0 x 10 ⁻⁶ mm / mm °c	---
Thermal Conductivity	ASTM C 518 CGS ⁽²⁾ 6 mm	0.416 W/mK	---
Electrostatic Property	EN 61340-4-1 HGS ⁽¹⁾ , CGS ⁽²⁾ Surface Resistance (Rs)	Rs ≥ 1x10 ⁹ Ω	---
Total Volatile Organic Compound Emission	ASTM D5116 6 mm	< 0.010 mg/m ² /hr	< 0.5 mg/m ² /hr
Total Migration of materials in contact with food	Food Contact Materials Regulation (EC) 1935/2004	Test report No. 0003165598/30 AZ 222179 TÜVRheinland ⁽⁹⁾	Pass According to (EC) 1935/2004
Release of PCP (Penta Chloro Phenol)	Intertek PV_C_01.01.02_02-08 (2014-01)	N.D. (Not Determinable)	0.1 mg/kg
Chemical Resistance	SEFA 8-1999	See Table 1	---
Micro Scratch Thermal Healing	Gentas Internal instruction	See Cleaning and Maintenance Instructions	---

Remarks :

- (1) HGS = Horizontal Grade Standard Laminate
- (2) CGS = Compact Grade Standard Laminate
- (3) Gentas Internal test procedure for thermal healing is available upon Request only
- (4) Rating 5: No visible change in gloss and surface finish
- (5) Gentas Internal test procedure for resistance to finger Print is available upon Request only
- (6) Rating 5: Surface unchanged comparing to reference sample (No moisture / oily residue)
- (7) For Thermal Healing instructions, please see elow "Cleaning and Maintenance instructions"
- (8) FR grade CGF is produced only upon customer request
- (9) Test report available upon request
- (10) The Color Difference refers to the color deviation from the master sample as agreed between Gentas and the customer per batch size (Refer to project batch size).
- (11) Gentas internal test method for evaluation of color difference in plain color design. As part of Gentas quality test, The color difference is evaluated and can be guaranteed according to the claimed value . Any other color testing method and/or tested value will not be acceptable by Gentas and can not be the base to any claim.
- (12) The Antibacterial activity is tested with 3 different types of bacteria and test reports are available upon request
- (13) DSM: Deutsche Sammlung von Mikroorganismen und Zellkulturen (German Collection of Microorganisms and Cell Cultures GmbH)
- (14) Log10 reduction from initial CFU cm²
- (15) A logarithmic bacterial reduction of the antimicrobial sample compared to the corresponding reference sample of ≥ 3 log levels is considered as an assessment criterion for passing the antimicrobial test.
- (16) ATCC = American Type Culture Collection

ZERO® PST Anti Bacterial Product Description :

General : ZERO PST Anti Bacterial is an innovative laminate born from the market demand for a progressive surface that will combine both the technical and aesthetical aspects of decorative laminate.

The decorative surface is produced by a progressive surface technology (PST) that create an extremely resilience surface that enable to acquire the following properties:

- @ Warm & soft touch – the special surface finish imitate the natural touch of wood and not as in melamine surfaces / Plastic materials that gives “cold” touch while handling.
- @ Low light reflectivity – the ultra matt surface prevents any light reflection that might be needed both Design and environmental wise.
- @ Anti Finger print – the surface characteristic enables the repellency of any moisture residue due to finger Touch and hens do not leave any finger print after touching / handling.
- @ High scratch and micro scratch resistance – the surface is resistance against scratches (caused by sharp Edges) and against micro scratch (caused by abrasive materials)
- @ Hygienic – suitable for use as kitchen worktop
- @ Anti Bacterial – suitable for use is area where Anti Bacterial activity needed
- @ Chemical resistance – suitable for surface cleaning with all household cleaners / reagents and resistance Against most of the industrial chemicals (Hard acids / Hard bases / organic solvents / inorganic salts)
- @ HPL property – Zero PST Anti Bacterial acquire all the physical & mechanical properties demand for thin HPL (HGS) and compact laminates (CGS).

All the above listed advantages enable the ZERO PST Anti Bacterial to be used in various areas such as: Kitchen, living rooms, bathrooms, dining rooms, furniture, restaurant's, healthcare facilities and hospitals.

ZERO® PST Chemical Resistance According To SEFA 8-1999 (Ref. 2006)

Test No	Chemical Reagent	Test Method ^{(1),(2)}	Test Result ⁽³⁾
1	Hydrochloric Acid 10%	B	0
2	Hydrochloric Acid 37%	B	0
3	Sulphuric Acid 33%	B	0
4	Sulphuric Acid 98%	B	1
5	Nitric Acid 30%	B	0
6	Nitric Acid 65%	B	0
7	Phosphoric Acid 85%	B	1
8	Acetic Acid 99%	B	1
9	Hydrofluoric Acid 40%	B	0
10	Chromic Acid 10%	B	0
11	Ammonium Hydroxide 28%	B	1
12	Sodium Hydroxide 46%	B	0
13	Silver Nitrate 1%	B	1
14	Potassium Permanganate 10%	B	2
15	Ferric (III) Chloride 10%	B	0
16	Copper Sulphate 10%	B	0
17	Sodium Hypochlorite 16%	B	1
18	Sodium Chloride 10%	B	0
19	Formaldehyde 10%	A	0
20	Furfural	A	0
21	Formic Acid 90%	B	1
22	Phenol 90%	A	0
23	Acetone	A	2
24	Mono Ethylene Glycol	A	0
25	Ethyl alcohol	A	0
26	Ethylene Glycol Mono Butyl Ether	A	0
27	Methyl Ethyl Ketone	A	2
28	Dichloromethane	A	1
29	Ethylacetate	A	2
30	n – Butyl Acetate	A	2
31	n – Hexane	A	2
32	Methyl Alcohol	A	1
33	Methyl Isobutyl Ketone	A	2
34	TetraHydroFurane (THF)	A	2
35	Toluene	A	1
36	Tri Chloro Ethylene	A	2
37	Xylene	A	1
38	Iodine Tincture	B	2
39	Hydrogen Peroxide 3%	A	1
40	Malachite Green Oxalate 1%	B	1
41	Methylene Blue 1%	B	1
42	Methyl Violet 2B 1%	B	2
43	Wright Stain 1%	B	2
44	Chlorine 5 PPM	B	0

Remarks:

(1) Method A: Saturate a cotton ball with the chemical reagent . Place the saturated cotton ball on the surface of the laminate and cover the saturated cotton ball with a watch glass 10 cm diameter . Leave the covered reagent for 24 hours. After 24 hour wash the panel with water , clean with detergent and rinse with de-ionized water . Leave the tested laminate for 24 hours and evaluate according to the level chart⁽³⁾.

(2) Method B: Place 5 drops of the chemical reagent on the decorative surface of the tested laminate and cover the chemical reagent with a watch glass 10 cm diameter . Leave the covered reagent for 24 hours. After 24 hour wash the panel with water , clean with detergent and rinse with de-ionized water . Leave the tested laminate for 24 hours and evaluate according to the level chart⁽³⁾.

(3) Level Chart:

Level No.	Description
0	No detectable stain, loss of gloss or change to the surface of the laminate
1	Slight stain or loss in gloss but no change to the surface of the laminate
2	Severe stain or slight change to the surface of the laminate
3	Swelling, pitting, cracking or erosion to the surface of the laminate

ZERO® PST Cleaning and Maintenance Instructions:

General:

As the surface of ZERO PST Anti Bacterial acquire low light reflectivity, the use of any cleaning materials that contain abrasive substances and/or cleaning agents that contain low acidic value or high alkali value, might damage the surface permanently. Hence, the following cleaning instruction is recommended:

Cleaning Agents that should not be used :

The following cleaning agents should not be used: Abrasive scrubbing liquid, Abrasive scrubbing solid, Steel wool, Abrasive sponge, cleaning agents with low acidic value, cleaning agents with high alkali value

Cleaning Cloth / paper / sponge:

- Cleaning cloth should be free of dust that might scratch the surface
- Non abrasive Micro Fiber cloth use is highly recommended (Any non abrasive Micro Fiber cloth available in the market)
- Melamine Sponge
- Cleaning paper – any cleaning paper suitable for kitchen use

Cleaning Agents:

- Warm water: heated tap water up to 40°C
- Degreaser spray: Any Degreaser spray available in the market for kitchen surface cleaning
- Organic Solvent: Acetone / Methanol / Ethanol suitable for cleaning use

- UNIKA Super Matt Laminate Cleaner

Cleaning food stuff:

- Any food stuff such as Coffee, Tea, Milk, Red Wine, Balsamic vinegar, Oil, Soft Drinks, Coca Cola, Fruit juice, wine, mustard, jam or ketchup must be cleaned from the surface of the laminate
- First remove the stain with a degreaser spray and a dry micro fiber cloth
- Second clean the residue with warm water and microfiber cloth
- In case the stain is not removed use UNIKA Super Matt Laminate cleaner according to producer instruction
- In case the stain is not removed see blow instructions for cleaning oily surface
- In case the stain is removed wipe any residue of moisture with a dry micro fiber cloth

Cleaning oily surface:

- Any substance that might cause oily surface such as vegetable oil, greasy cooked food, animal fat, glues or Acaia gun must be cleaned from the surface of the laminate.
- First remove the residue with cleaning paper.
- Second remove any stain left on the surface with a degreaser spray and a dry micro fiber cloth
- In case the stain is not removed use UNIKA Super Matt Laminate cleaner according to producer instruction
- In case the stain is not removed see blow instructions for cleaning sticky surface
- In case the stain is removed wipe any residue of moisture with a dry micro fiber cloth

Cleaning cosmetic product surface:

- Any cosmetic product such as Nail Varnish, Lipstick or facial powder must be cleaned from the surface of the laminate
- First remove the residue with a cleaning paper soaked with organic solvent
- Second remove any stain left on the surface with a degreaser spray and a dry micro fiber cloth
- Third clean the surface with warm water and microfiber cloth
- In case the stain is not removed use UNIKA Super Matt Laminate cleaner according to producer instruction
- Wipe any residue of moisture with a dry micro fiber cloth

Cleaning sticky surface:

- Any substance that might cause sticky surface as wax, solvent base glue, silicone base glue, adhesive tape, solvent base paint, nail polish, hair spray, oily facial past, Marker, Shoe polish, Pencil, graffiti spray or lacquers must be removed from the surface of the laminate
- First remove the residue with a cleaning paper soaked with organic solvent
- Second remove any stain left on the surface with a degreaser spray and a dry micro fiber cloth
- Third clean the surface with warm water and microfiber cloth
- In case the stain is not removed use UNIKA Super Matt Laminate cleaner according to producer instruction
- Wipe any residue of moisture with a dry micro fiber cloth

Micro Scratch Thermal Healing Instruction:

Micro Scratch Thermal Healing process: Heat iron to medium/high temperature (180 - 200°C). Place a Wet towel (Paper base / full cotton base) on the area of the micro scratch. Place the hot iron on the wet Towel with a slight press for 20 seconds (Max.). Remove the iron and the wet towel and wipe

With a dry towel (Paper base / full cotton base). wait for 2 minutes to examine the surface . The Thermal healing process can be applied on the same area (Heated and Micro scratched) only for 1 (one) Time and any attempt to return the Process for the 2nd time will damage the surface visual and physical Properties.

Maintenance Instructions:

As the surface of ZERO PST Anti Bacterial acquire an anti static characteristics , no need for daily maintenance but only in case of dirt or dust. In case of micro scratches see the following maintenance instructions.

Periodic maintenance:

- Use a damp micro fiber cleaning cloth soaked with warm water
- Wipe any residue of moisture with a dry micro fiber cloth
- In case the stain is not removed use UNIKA Super Matt Laminate cleaner according to producer instruction

Micro scratches maintenance:

- See the above instructions for Micro Scratch Thermal Healing process