

G-Com-Anti Graffiti Technical Data (1)

Characteristics	Test Method	Tested Value	Required Value
Thickness	EN 438-2 section 5	According to the required thickness	$2.0 \leq t < 3.0$ mm : ± 0.20 mm $3.0 \leq t < 5.0$ mm : ± 0.3 mm $5.0 \leq t < 8.0$ mm : ± 0.4 mm $8.0 \leq t < 12.0$ mm : ± 0.5 mm $12.0 \leq t < 16.0$ mm : ± 0.6 mm $16.0 \leq t < 20.0$ mm : ± 0.7 mm $20.0 \leq t < 25.0$ mm : ± 0.8 mm $25.0 \leq t$: According To Agreement customer / producer
Density	ISO 1183 - 1	1.4	Min. 1.35 gr/cm ³
Wear Resistance	EN 438-2 section 10 CGS	IP = 185 Rev. Wear Value = 485 Rev.	Initial Point ≥ 150 Rev. Wear Value ≥ 350 Rev.
Scratch Resistance	EN 438-2 section 25 CGS	3 N 4 N	Flat Surface Min. 2 N Textured Surface Min. 3 N
Impact Resistance	EN 438-2 Big Ball section 21 CGS $2.0 \leq t < 6.0$ mm $t \geq 6.0$ mm	No Crack , 4,5 mm No Crack , 3,5 mm	1400 mm height : no crack , 10 mm Max. 1800 mm height : no crack , 10 mm Max.
Resistance To Crazing (20 Hours @ 80°C)	EN 438-2 section 24 CGS / CGF	Level 4	Min. level 4

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Characteristics	Test Method	Tested Value	Required Value
Resistance to Dry Heat at 180°C	EN 438-2 section 16 CGS		
	Glossy Surface Finish Other Surface Finish	Level 4 Level 5	Min. level 3 Min. level 4
Resistance to Water Vapor	EN 438-2 section 14 CGS		
	Glossy Surface Finish Other Surface Finish	Level 4 Level 5	Min. level 3 Min. level 4
Resistance to Boiling Water	EN 438-2 section 12 CGS		
	$2.0 \leq t < 5.0$ mm	2.2% 3.1%	Max. 5% in weight Max. 6% in thickness
	$t \geq 5.0$ mm	0.55% 0.65%	Max. 2% in weight Max. 2% in thickness
	Glossy Surface Finish Other Surface Finish	Level 4 Level 5	Min. Level 3 Min. Level 4

G-Com- Anti Graffiti Technical Data (2)

Characteristics	Test Method	Tested Value	Required Value
Resistance to Cigarette Burn	EN 438-2 section 30 CGS	Level 4	Min. level 3
Resistance to Staining	EN 438-2 section 26 CGS Group 1+2 Group 3	Level 5 Level 5	Min. level 5 Min. level 4
Graffiti Resistance	ASTM D 6578-00	See Annex 1	---
Resistance to Detergents	DB TL 918 340 (Table 1)	See Annex 2	---
Resistance to graffiti removal agents	DB TL 918 340 (Table 1)	See Annex 3	---
Flatness	EN 438-2 section 9 CGS $2.0 \leq t < 6.0$ mm $6.0 \leq t < 10.0$ mm $t \geq 10.0$ mm	1.23 mm 1.46 mm 1.87 mm	Max. 8 mm / 1 M length Max. 5 mm / 1 M length Max. 3 mm / 1 M length

G-Com- Anti Graffiti Technical Data (2)

Characteristics	Test Method	Tested Value	Required Value
Light fastness	EN 438-2 section 27 CGS Grey Scale	Level 5	Min. level 4
High Temp. stability 70°C	EN 438-2 section 17 CGS 2.0 ≤ t ≤ 5.0 mm	L: 0.22% W: 0.35%	L: Max. %0.4 W : Max. 0.8%
	t ≥ 5,0 mm	L: 0.18% W: 0.23%	L: Max. %0.3 W : Max. 0.6%
Tensile Strength	EN ISO 527 – 2 CGS	\ 85 MPa	Min. 60 MPa
Flexural Strength	EN ISO 178 CGS	 114 MPa	Min. 80 MPa
Flexural Modulus	EN ISO 178 CGS	 16.522 Mpa	Min. 9000 MPa
Coefficient Of Linear Thermal Expansion (COTE)	ASTM D696-08 ⁽³⁾	6,0 x 10 ⁻⁶ mm / mm °c	---

Remarks :

@ CGS = Compact Grade Standard Laminate

@ Required Values Based on 438-4

Annex 1 : Graffiti Resistance According To ASTM D 6578-00

Design Marker	Marker 1	Marker 2	Marker 3	Marker 4	Marker 5	Marker 6	Marker 7	Marker 8	Marker 9
G-Com-Anti Graffiti	Level 3	Level 3	Level 3	Level 3	Level 3	Level 3	Level 3	Level 3	Level 3

Notes :

- ASTM 6578-00 outlines the sequence of cleaning procedures for the test samples according to :

Level 1 : With a dry cotton cloth

Level 2 : 1% aqueous detergent solution

Level 3 : Citrus cleaner

Level 4 : Isopropanol (IPA)

Level 5 : Methyl Ethyl Ketone (MEK)

The material's graffiti resistance designation level for each marking agent is

Assigned by the first cleaning method that removes the mark . A "Not Clean-able" designation is assigned if the

Graffiti mark can not be removed after all of the prescribed cleaning procedures are used.

-A total of nine (9) marking agents used in the laboratory tests including : five (5) specifically listed in ASTM 6578-00:

Marker 1 :Blue Wax Crayon (Dixon™)

Marker 2 : Blue Solvent-Based Marker (Sanford™ Sharpie™)

Marker 3 : Black Permanen Marker (Avery™ Marks-a-lot™)

Marker 4 : Red Solvent-based Spray Paint (Krylon™)

Marker 5 : Black Water-Based Ink Marke (Crayola™)

Four (4) additional marking agents were added by Gentas :

Marker 6 : Sanford Magnum 44™

Marker 7 : Sanford King Size™

Marker 8 : Sanford Expo 2™ Dry Erase

Marker 9 : Sanford SilverCoat™ Metallic Metal Paint Marker .

-Cleanability Levels refer to minimum cleaning method necessary to obtain a visually clean surface.

Annex 2 : Resistance to Detergents According to DB TL 918 340(1) (March 2005) :

Detergent	Result
Benduro Forte ⁽²⁾	No change of the surface
Alkaline: 1:1 concentration	
Puro ⁽²⁾	No change of the surface
Hydrochloric: 1:1 concentration	
Rapol 58 ⁽²⁾	No change of the surface
Phosphorous : 1:4 concentration	
Rapidol S ⁽²⁾	No change of the surface

(1) Application of detergent upon the surface covered with a watch glass for 4 hours @ 23°C

(2) Bendrol Forte , Puro , Rapol 58 and Rapidol S products from company Dr. Schnell GmbH

Annex 3 : Resistance to graffiti removal agents according to DB TL 918 340(1) (March 2005) :

Graffiti removal agent	Results	
AGS 221 ⁽²⁾	Immediate Removal	No changes of the surface
	After 24 hr.	No changes of the surface
Novo Pen off ⁽³⁾	Immediate Removal	No changes of the surface
	After 24 hr.	No changes of the surface

(1) Application of detergent upon the surface covered with a watch glass for immediate removal and after 24 hours @ 23°C removal .

(2) AGS 221 product from company Tensid Deutschland GmbH .

(3) Novo Pen off product from company Dr. Schnell GmbH