TECHNICAL DATASHEET

AV991S
Edition 02/04/2021 - rev. 1 of 10/09/2021

AV/991-S

Description

Gloss transparent self-adhesive cast film for surfaces requiring maximum hygiene. The film is designed for reduce the transmission of viruses and to prevent the proliferation of bacteria, it can be applied directly on the surfaces that require protection. The vinyl, which has been certified against human Coronavirus HCoV-229E / SARS-CoV-2 and the most common bacteria which are in places most frequented, such as public places, food industries and hospitals, has achieved the certifications ISO 21702 and ISO 22196. The particular formulation maintains its protective properties, even after handling and frequent washing.

Colours: transparent gloss.

Technical information

Technical data

Film: Cast P.V.C. certified according to ISO 21702:2019 and ISO 22196:2011

Antiviral efficacy (%): HCoV-229E control of viral activity up to 80,05% after 15 minutes and 99,37% after 1 hour. Tested on human coronavirus (report n° 2102FSAPA001).

SARS-CoV-2 control of viral activity up to 78,62% after 1 hour and 95% after 2 hours (report n° 2100031/01)

Antibacterial efficacy (%): control of bacterial activity up to 99,9% or higher for all bacterial shown below (report n° 1039783.450/13968 – 1039691.49/13893):

- Staphylococcus aureus ≥ 99.9%
- Escherichia coli ≥ 99.9%
- Listeria monocytogenes ≥ 99.9%
- Methicillin resistant Staphylococcus aureus (MRSA)≥ 99.9%
- Pseudomonas aeuriginosa ≥ 99.9%
- Salmonella enteridis ≥ 99.9%

Reaction to fire classification: B-S1-D0 (Standard EN 13501-1:2019 Classification report CSI n° 0684\DC\REA\21_3).

Railway vehicles classification:	The product complies with the tests T10.01, T10.02, T10.04 and T11.01 requirements R1 and R7 for HL1 and HL2 of standard EN 45545-2:2013+A1:2015 (Classification report CSI n° 0077\DC\TOX\21). The product complies with the tests T02 requirements R1 and R7 for HL1, HL2 and HL3 of standard EN 45545-2:2013+A1:2015 (Classification report CSI n° 0873\DC\REA\21). The product complies with the tests T03.01 requirements R1 and R7 for HL1, HL2 and HL3 of standard EN 45545-2:2013+A1:2015 (Classification report CSI n° 0873\DC\REA\21_2).
Washing resistance:	The particular formulation preserves its properties, even after handling and frequent washing (report n° 1039691.49/13893).
Film Thickness (without adesive):	60 +/- 5% µm (Op. Istr. n° 4).
Liner:	Clay coated paper 1 side siliconised.
Release:	100 +/- 30 cN/20mm.
Adhesive:	ultra-permanent acrylic high cohesion.
Grammage:	25 +/- 5 g/m2.
Adhesion after 20 min.:	min. 350 N/m. Peel 180° at 20°C on steel (Op. Istr. n° 7).
Adhesion after 72 h. :	min. 500 N/m. Peel 180° at 20°C on steel (Op. Istr. n° 7).
Method of application:	dry or wet.
Application temperature:	suggested between 12° and 28°C.
Shrinkage:	< 0,2 mm after 48 h. at 70°C on steel (Op. Istr. n° 8).
Temperature resistance:	from -50°C to +90°C adhered to steel no variation (Op. Istr. n° 15).

Average expected lifetime

The below mentioned data refer to the film as it is, applied on a standard flat surface and not taking into consideration the final application. Therefore, they are indicative values, intended as a source of information only, and do not constitute a guarantee.

Due its particular formulation, the film's properties allow a longlasting control of viral and bacterial activity.

To keep the effectiveness of the film unchanged over time, it is important to prevent dirt from forming a layer on the surface. It is therefore important to keep the material clean by using cleaners that do not release residues on the surface.

To prolong the life of the film as much as possible and for correct cleaning, it is recommended to follow the Application, Cleaning and Maintenance instructions, listed below in this technical data sheet.

Exposure of the film to sources of heat, direct sunlight or the use of unsuitable detergents could compromise the control of viral and bacterial activity and / or reduce its life expectancy.

Data from lab testing (UV – XENON TEST):
Internal use

Storage

1 year, film must be kept warehoused at room temperature (20°C / 50% R.H.) suspended horizontally or placed in a vertically upright position in polythene bag.
During the storage, gloss vinyl could become matt. This phenomenon, due to the pressure of the rolling up of the material, could worsen when close to the cardboard core and, is more frequent when the storage temperature is above 25°C and/or when the vinyl is particularly glossy and soft.

Note

The values and the data given are based on tests we believe to be reliable and are typical values intended only as a source of information, and do not constitute a guarantee. **Purchasers must independently determine, before use, the suitability of the material for their own specific use and under their own operating conditions** with the aim to determine if the APA product is suited for the specific goal and is furthermore suited for the use and the pre-selected application-method.

All APA over laminate films are produced and packed under very strict quality control procedures in order to guarantee that the films are clean, free of dust and other impurities that might compromise the usage. Before any lamination takes place it's important that the inks of the printed graphic are thoroughly dried. The residual solvents can otherwise change the specific features of the product. Purchasers must independently assess the suitability of the product with the aim to determine if the APA product is suited for the specific goal.

General information

Warranty / exclusions of liability

APA materials are guaranteed to be free from all manufacturing defects.
In the event of ascertained defectiveness of the product, APA shall replace the materials used upon manufacturing the decorations.
APA shall not be liable for any additional costs, such as the work necessary for reprinting the design, the losses related to production time, the costs for removing or re-applying the graphics. APA, in addition, does not assume responsibility for the replacement of materials not produced by APA.

A.P.A. SpA cannot be held responsibility for any damages other than the substitution of the goods.

APA guarantees to maintain the interval of the variability of the colours of its products in the best possible way, using instrumental and visual checks.

To avoid colour variation, all the parts of the vinyl applied have to belong to the same production batch. It is also the case for decorations that are required for a long duration of time, updating or improvements of the decoration. Therefore, it is recommended to ask beforehand for the required material, belonging to the same production batch.

No salesman, representative, agent or distributor has authority to supply data different from those reported in this Technical Data Sheet. To make improvements all products may be modified without prior notice.

For a safe use of the self-adhesive materials by A.P.A. it is recommended to read the dedicated safety information.
For a safe use of the cleaners mentioned in this data sheet it is recommended to read the dedicated safety sheets.

Application

The film is conceived for a highly professional use.
The staff that apply the vinyl must possess the requirements and the training necessary.

Before applying the film always test the compatibility between the self-adhesive vinyl and the surface of the decoration and in particular verify the presence of oil, wax and other substrates, including those made by the cleaning, that could compromise the adhesion of the film and cause it to detach in the future. Make a general cleaning of the surface with APA EASY CLEANER. Re-clean the corners, edges, slits, rivets and all the areas where the vinyl undergoes an increased shaping with APA CLEANER XT.

Before using APA EASY CLEANER and CLEANER XT always test the compatibility of the products on a corner of the surface which has to be cleaned.

This vinyl is not compatible with:
- porous surfaces in general either made of plastic or of other material
- surfaces with small superficial tensions, silicone, rubber, PP, PE and all apolar surfaces
- painted surfaces with poor adhesion of the paint to the surface underneath
- dusty surfaces
- dirty surfaces such as walls and non-smooth surfaces
- flexible surfaces such as banners, truck curtains or textiles
- surfaces that give out gas (out-gassing)
- gasoline vapors or spillages (only short periods of contact and time can be tolerated)

This film is designed for a large range of surfaces and can be used as a laminate on APAPrint films.

Before any lamination takes place it's important that the inks of the printed graphic are thoroughly dried. The residual solvents can otherwise change the specific features of the product. Therefore after print we recommend to allow the film to rest for at least 48 hours in a room with a temperature of 20°.

It is recommended to apply the film in a room with a temperature between 10 and 28°C.
For the application on printed vinyl, cold laminating machines can be used.

Cleaning the vinyl

Use water with soft cloths and non-aggressive detergents.
Do not use rough sponges and cloths, abrasive creams or very strong solvents.
Cleaning with unsuitable products and tools could cause a premature deterioration of the vinyl or the loss of the control of viral and bacterial activity.
To remove dirt we recommend the use of alcohol and/or active chlorine based disinfectants. **Do not use acid, alcaline substances or detergents containing solvents**.

If water under pressure is used for cleaning, never aim the jet at the edges of the film because the force of the water could lift it or detach it.
Incorrect handling of the film could result in an irreversible opaque and scratched effect, deterioration and the lose of viral and bacterial activity control. To obtain the maximum antibacterial effect we recommend continual maintenance of the film as the presence of dirt could considerably reduce its effectiveness.

Maintenance

The surface of the vinyl is delicate and therefore should be treated with care. Avoid rubbing against objects that could cause scratches or ripping of the vinyl beyond repair.
We recommend protecting the decorated surface from the sun and the elements to the greatest extent possible.
If a film deterioration should arise, for example change of colour or become brittle, then an immediate removal is recommended.
For a good maintenance of the vinyl regular cleaning is recommended.

CERTIFICATE OF ANALYSIS

CUSTOMER

Addmaster Ltd
Darfin House
Priestly Court
Staffordshire Technology Park
Stafford
ST18 0AR
UK.

CERTIFICATE NO. 1039783.450/13968

CUSTOMER REF. 20240

SAMPLE DETAILS

APA SPA

DATE RECEIVED 12/06/2020

ORDER NO.

METHOD: Determination of Antibacterial Activity using Test Based on MOD ISO 22196

DATE ANALYSED 17/06/2020

DATE REPORTED 19/06/2020

RESULTS (AS CFU CM^{-2})

SAMPLE	SPECIES	CONTACT TIME 0 hrs	CONTACT TIME 24 hrs	REDUCTION (INITIAL) Log 10	REDUCTION (INITIAL) %
CONTROL	*L. monocytogenes*	1.3E+04	< 11.11		
TREATED (AV / 9 *)	*L. monocytogenes*	1.3E+04	< 11.11	≥ 3.06	≥ 99.91%
CONTROL	MRSA	1.8E+04	< 11.11		
TREATED (AV / 9 *)	MRSA	1.8E+04	< 11.11	≥ 3.21	≥ 99.94%
CONTROL	*Ps. aeruginosa*	1.7E+04	< 11.11		
TREATED (AV / 9 *)	*Ps. aeruginosa*	1.7E+04	< 11.11	≥ 3.19	≥ 99.94%
CONTROL	*S. enteritidis*	2.1E+04	1.9E+04		
TREATED (AV / 9 *)	*S. enteritidis*	2.1E+04	< 11.11	≥ 3.28	≥ 99.95%

Key: NS = Poor survival on control supplied.

The above data show the difference in the population following contact with the surface of the samples listed for 24 hours at 35°C under a RH of > 95% relative to the initial population.

Certificate valid for up to 2 years from date of test.

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MANAGING DIRECTOR
Peter D Askew

CERTIFICATE OF ANALYSIS

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CERTIFICATE NO. 1039691.49/13893

CUSTOMER REF. 20240

SAMPLE DETAILS

APA SPA

DATE RECEIVED 01/06/2020

ORDER NO.

METHOD: Determination of Antibacterial Activity using Test Based on MOD ISO 22196

DATE ANALYSED 03/06/2020

DATE REPORTED 05/06/2020

RESULTS (AS CFU CM^{-2})

SAMPLE	SPECIES	CONTACT TIME		REDUCTION (INITIAL)	
		0 hrs	24 hrs	Log 10	%
CONTROL	E. coli	2.0E+04	< 25.00		
TREATED (AV / 9 *)	E. coli	2.0E+04	< 25.00	≥ 2.89	≥ 99.87%
CLEANED CONTROL	E. coli	2.0E+04	1.5E+04		
CLEANED TREATED (AV / 9 *)	E. coli	2.0E+04	< 11.11	≥ 3.24	≥ 99.94%
CONTROL	S. aureus	2.2E+04	< 25.00		
TREATED (AV / 9 *)	S. aureus	2.2E+04	< 25.00	≥ 2.94	≥ 99.89%
CLEANED CONTROL	S. aureus	2.2E+04	< 11.11		
CLEANED TREATED (AV / 9 *)	S. aureus	2.2E+04	< 11.11	≥ 3.29	≥ 99.95%

Key: NS = Poor survival on control supplied.

The above data show the difference in the population following contact with the surface of the samples listed for 24 hours at 35°C under a RH of > 95% relative to the initial population.

Certificate valid for up to 2 years from date of test.

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MANAGING DIRECTOR
Peter D Askew

R2102FSAPA001-1
Antiviral activity of AV/9* surface against human coronavirus HCoV-229E with contact times of 15 and 60 minutes.
Adapted protocol from ISO 21702 (2019) standard

CLIENT	APA S.p.A Messieurs Mattia COLOMBO/ Alfredo COLOMBO Via Ruffilli 6 20042 Pessano Con Bornago Italy
TEST LABORATORY	S.A.S VIRHEALTH Centre d'Innovation Lyonbiopôle Bâtiment Domilyon, 321 avenue Jean Jaurès, 69007 Lyon France
TECHNICAL CONTRIBUTION	Léa Szpiro, technical manager Loranne Durimel, laboratory technician

Quality validation
Name : Dr Vincent MOULES, CEO Date : Lyon, 02/03/2021 Signature : VirHealth RTH Laennec 7-11 rue G. Péradin, 69008 Lyon France

Report includes 12 pages

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I. CONCLUSION

Antiviral activities of the AV/9* surface and non-active surface have been tested under conditions defined by the ISO 21702 (2019) adapted protocol for contact times of 15 and 60 minutes against the human coronavirus HCoV-229E.

The stainless-steel surface is the control for this test.

- AV/9* surface, 15 minutes of contact time

Under experimental conditions (20°C, 15 minutes), the AV/9* surface shows an antiviral activity per cm^2 associated with a logarithmic reduction of 0.7 log_{10} (80.05%) efficiency under the ISO 21702 adapted protocol.

PRODUCT	Contact time	Antiviral activity R (log_{10}/cm^2)	Antiviral activity (%)
AV/9*	15 minutes	**R = 0.7**	80.05

- AV/9* surface, 60 minutes of contact time

Under experimental conditions (20°C, 60 minutes), the AV/9* surface shows an antiviral activity per cm^2 associated with a logarithmic reduction of 2.2log_{10} (99.37%) efficiency under the ISO 21702 adapted protocol.

PRODUCT	Contact time	Antiviral activity R (log_{10}/cm^2)	Antiviral activity (%)
AV/9*	60 minutes	**R = 2.2**	99.37

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II. CONTRACTUAL DOCUMENTS

The present service is defined by the following contractual documents:

. Quotation	DEV0293 from 22/12/2020
. Order	Good for agreement date: from 23/12/2020

III. TEST CONDITIONS AND SAMPLES DATA

III.1 Samples identification

Surface	**AV/9***	Stainless-steel surface
Appearance	Transparent	Grey
Size (cm)	5 cm x 5 cm	5 cm x 5 cm
Thickness (mm)	< 1	< 1
Porous / non-porous	Non-porous	Non-porous

Manufacturer: APA S.p.A

Supplier: APA S.p.A.

Storage conditions: room temperature

Evaluation period: 02/2021

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III.2 Experimental conditions

Test surface: **AV/9***

Experimental Conditions	
Date	28/01/2021
Viral strain	Human coronavirus HCoV-229E
Inoculum size (cm²)	4 cm x 4 cm = 16 cm²
Inoculum volume	400 µL
Cover film	n.a.
Temperature	22.5°C ± 0.1
Humidity HR (%)	43%± 5
Contact time	15 minutes 60 minutes
Interfering substance	n.a.
Neutralisation	10mL of SCDLP medium
Quantification	endpoint titration on permissives cells
Number of wells per dilution	8
Incubation temperature	34 ± 1 °C

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IV. RESULTS

IV.1 Antiviral activity of the AV/9* surface against human coronavirus HCoV-229E for contact times of 15 and 60 minutes

a. Cell susceptibility

Surface	log_{10} $TCID_{50}$/mL
SCDLP medium	6.5
AV/9*	6.5
Non active surface	6.4
Active Surface: Difference < 0.5 log_{10} ☒ yes ☐ no Inactive Surface: Difference < 0.5 log_{10} ☒ yes ☐ no	

b. Cytotoxicity

The test surface cytotoxicity is determined by reading of cytopathic effect (CPE) on MRC5 permissive cells and quantified by $TCID_{50}$ technique.

For viral recuperation on surface, the surfaces are submerging in 10mL of SCDLP medium (recuperation buffer). The recuperation buffer cytotoxicity is determined by reading of cytopathic effect (CPE).

Under test conditions, the recuperations buffers from AV/9* and reference surfaces did not show cytopathic effects on MRC5 cells for contact times of 15 and 60 minutes.

The test results are dependent on and take into account the cytotoxicity results.

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c. Inactivation of antiviral activity

Product	log_{10} $TCID_{50}$/mL
S_n = SCDLP medium	4.3
S_t = active surface	4.1
S_u = non-active surface (reference)	4.1
$S_n - S_u \leq 0.5$ ☒ oui ☐ non $S_n - S_t \leq 0.5$☒ oui ☐ non	

Explanations:

S_n: the average of the common logarithm of the infectivity titer of virus quantified with the SCDLP broth for negative control.

S_u: the average of the common logarithm of the infectivity titer of virus recovered from three of the untreated test specimens

S_t: the average of the common logarithm of the infectivity titer of virus recovered from three of the test specimens.

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d. Test

Raw data for antiviral activity of AV/9* and reference surfaces against human coronavirus HCoV-229E under test conditions (20°C, 15 and 60 minutes) are presented in appendices.

Results have been determined by visual reading of cytopathic effects (CPE) and quantified by $TCID_{50}$ technique on MRC5 cells.

Surface	Cytotoxicity (log_{10} $TCID_{50}$)	Specimen	U_o (log_{10} $TCID_{50}/cm^2$)	U_{t15} (log_{10} $TCID_{50}/cm^2$)	U_{t60} (log_{10} $TCID_{50}/cm^2$)
Stainless-steel surface	0.5	L1	4.1	4.1	3.8
		L2	4.3	4.2	3.9
		L3	4.3	3.8	3.9
		Average	**4.2**	**4.0**	**3.9**

Surface	Cytotoxicity (log_{10} $TCID_{50}$)	Specimen	A_0 (log_{10} $TCID_{50}/cm^2$)	A_{t15} (log_{10} $TCID_{50}/cm^2$)	A_{t60} (log_{10} $TCID_{50}/cm^2$)
AV/9*	0.5	L1	3.9	3.3	1.6
		L2	4.2	3.3	1.9
		L3	4.2	3.3	1.7
		Average	**4.1**	**3.3**	**1.7**
		R($log_{10}TCID_{50}/cm^2$)	/	**0.7**	**2.2**

R is the antiviral activity
U_0 is the average of the common logarithm of the number of $TCID_{50}$ recovered from three untreated test specimens immediately after inoculation
U_t is the average of the common logarithm of the number of $TCID_{50}$ recovered from three untreated test specimens
A_0 is the average of the common logarithm of the number of $TCID_{50}$ recovered from three treated test specimens immediately after inoculation
A_t is the average of the common logarithm of the number of $TCID_{50}$ recovered from three treated test specimens.

The logarithmic value of the number of $TCID_{50}$ recovered immediately after inoculation from test specimens satisfy the requirement below: $(L_{max} - L_{min}) / (L_{mean}) \leq 0.2$.

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V. CONCLUSION

AV/9* surface shows antiviral activity of 0.7log_{10} $TCID_{50}/cm^2$ (80.05%) and 2.2log_{10} $TCID_{50}/cm^2$ (99.37%) against human coronavirus HCoV-229E after contact times respectively of 15 and 60 minutes at 20°C.

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VI. ANNEXES

VI.1 Materials and reagents

- Cell line

Name : MRC5 ATCC® CCL-171™

Number of passages: 19

Culture medium: EMEM (Lonza) with 10% of SVF (Dutscher), 1% of antibiotics (Gibco) et 1% of L-glutamine (Gibco)

- Viral strain

Name: human coronavirus 229E ATCC® VR-740™

Viral test suspension: 1.33x10^7 (batch number: 012021229-11)

Quantification technique :

- Successive tenfold dilution in infection medium: EMEM (Lonza) with 2% of SVF (Dutscher), 1% of antibiotics (Gibco) et 1% of L-glutamine (Gibco)
- Add 100µL of every dilution on 8 wells on a 96 plate.
- Incubate 7 days at 34°C, 5% $C0_2$

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VI.2 RAW DATA: $TCID_{50}$ quantification of human coronavirus HCoV-229E after 15 and 60 minutes, visual reading of cytopathic effects (8 wells per dilutions)

- Table 1: Inactivation of antiviral activity

	Product	contact time (min)	dilutions (-log)							
			p	1	2	3	4	5	6	7
supression of product's activity	SCDLP	/	44444444	44444444	44444444	11111111	0	0	0	0
		/	44444444	44444444	44444444	23212222	0	0	0	0
		/	44444444	44444444	44444444	11222022	0	0	0	0
	Stainless steel	/	44444444	44444444	44444444	00123244	0	0	0	0
		/	44444444	44444444	44444444	41203333	0	0	0	0
		/	44444444	44444444	44444444	14120023	0	0	0	0
	AV/9*	/	44444444	44444444	44444444	11002324	0	0	0	0
		/	44444444	44444444	44444444	20333333	0	0	0	0
		/	44444444	44444444	44444444	14120022	0	0	0	0

Explanations:
- *1-4: degrees of CPE in 8 cell culture unit (microtiter plate)*
- *0: no virus present*
- *n.a: not applicable*
- *n.d: not done*

- Table 2 : A0/U0

	Product	contact time (min)	dilutions (-log)							
			p	1	2	3	4	5	6	7
A0/U0	Stainless steel	0	44444444	44444444	44444444	11002421	0	0	0	0
		0	44444444	44444444	44444444	11413333	0	0	0	0
		0	44444444	44444444	44444444	22221412	0	0	0	0
	AV/9*	0	44444444	44444444	44444444	10002324	0	0	0	0
		0	44444444	44444444	44444444	44120222	0	0	0	0
		0	44444444	44444444	44444444	02333214	0	0	0	0

Explanations:
- *1-4: degrees of CPE in 8 cell culture unit (microtiter plate)*
- *0: no virus present*
- *n.a: not applicable*
- *n.d: not done*

- Table 3 : cytotoxicity

	Product	contact time (min)	dilutions (-log)							
			p	1	2	3	4	5	6	7
Cytotoxicity	Stainless steel	15	0	0	0	0	0	0	0	0
	AV/9*	15	0	0	0	0	0	0	0	0
Cytotoxicity	Stainless steel	60	0	0	0	0	0	0	0	0
	AV/9*	60	0	0	0	0	0	0	0	0

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Explanations:
- *1-4: degrees of CPE in 8 cell culture unit (microtiter plate)*
- *0: no virus present*
- *n.a: not applicable*
- *n.d: not done*

- Table 4 : cell susceptibility

	Product	contact time (min)	dilutions (-log)							
			p	1	2	3	4	5	6	7
cell susceptibility	SCDLP	/	44444444	44444444	44444444	44444444	11232222	0	0	0
	Stainless steel	/	44444444	44444444	44444444	44444444	22302222	0	0	0
	AV/9*	/	44444444	44444444	44444444	44444444	22324444	0	0	0

Explanations:
- *1-4: degrees of CPE in 8 cell culture unit (microtiter plate)*
- *0: no virus present*
- *n.a: not applicable*
- *n.d: not done*

- Table 5 : test

	Product	contact time (min)	dilutions (-log)							
			p	1	2	3	4	5	6	7
test	Stainless steel	15	44444444	44444444	44444444	11020222	0	0	0	0
		15	44444444	44444444	44444444	11110234	0	0	0	0
		15	44444444	44444444	44444444	40000111	0	0	0	0
	AV/9*	15	44444444	44444444	44444444	0	0	0	0	0
		15	44444444	44444444	44444444	0	0	0	0	0
		15	44444444	44444444	44444444	0	0	0	0	0
test	Stainless steel	60	44444444	44444444	44444444	22000202	0	0	0	0
		60	44444444	44444444	44444444	11112000	0	0	0	0
		60	44444444	44444444	44444444	11220020	0	0	0	0
	AV/9*	60	10110222	10102200	0	0	0	0	0	0
		60	44444444	11100230	0	0	0	0	0	0
		60	44444444	22200000	0	0	0	0	0	0

Explanations:
- *1-4: degrees of CPE in 8 cell culture unit (microtiter plate)*
- *0: no virus present*
- *n.a: not applicable*
- *n.d: not done*

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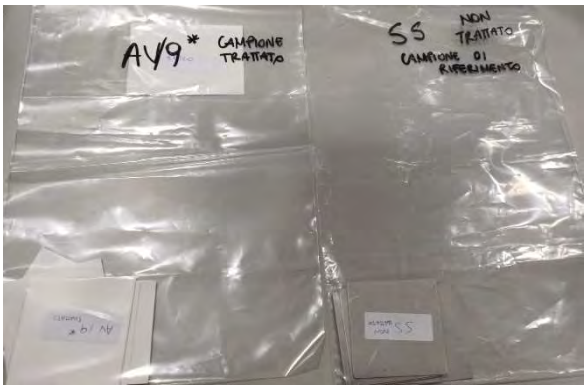
Test report n° 2100031/01

A.P.A. S.P.A.
VIA GIOVANNI MARRADI, 1
20123 - MILANO (MI) – IT

Test information	
MATERIAL	Self-adhesive PVC sheet
ITEM	**Treated sample: AV/9* - Untreated sample [stainless steel indicated by the Customer]: SS – Treatment: silver ions** 
METHOD	**ISO 21702:2019 "Measurement of antiviral activity on plastics and other non porous surfaces"**
Date of receipt	26 February 2021
Samples	• Treated sample: 50 x 50 mm^2, 1 mm thick; • Untreated sample: 50 x 50 mm^2, 1 mm thick; • Cover film: polypropylene film 40 x 40 mm^2, thickness 0.10 mm • All samples were disinfected with 70% EtOH; • Volume of test inocululm: 400 uL.
Conservation	Room temperature
Test temperature	25°C ± 1°C
Incubation temperature	37°C ± 1°C
Viral strain	**SARS-CoV-2_COV2019 ITALY/INMI1**
Permissive host cell line	VERO E6
Contact time	1h – 2h

Calculation of antiviral activity

Antiviral activity is calculated with the following formula:

$$R = Ut - At$$

where

R is the evaluation of antiviral activity

Ut is the mean of log TCID50/cm^2 of the 3 untreated samples at time Tx

At is the mean of log TCID50/cm^2 of the 3 treated samples at time Tx

Log $TCID_{50}$ inoculum: 6.88

Cytotoxicity test						
	Media Log $TCID_{50}$	$TCID_{50}$ /1 ml	S ($TCID_{50}$ / ml)	Test valid if	Results	
Negative control	4,50	$10^{4,50}$	Sn = $10^{4,50}$	n/a	n/a	n/a
Untreated sample	4,42	$10^{4,42}$	Su = $10^{4,42}$	$\|Sn-Su\| \leq 0.5$	0.08	Valid
Treated sample	4,17	$10^{4,17}$	St = $10^{4,17}$	$\|Sn-St\| \leq 0.5$	0.33	Valid

Test results							
	Time	Average Log $TCID_{50}$	$TCID_{50}$ /1 ml	N ($TCID_{50}$/cm^2)	Ut	R $\|Ut-At\|$	Test valid if result is between
Untreated sample	T0	5,17	$10^{5,17}$	9,17 x 10^5	n/a	n/a	2.5 x 10^5 – 1.2 x 10^6 ($TCID_{50}$/cm^2)
	T1	4,75	$10^{4,75}$	3,51 x 10^5	5,55	n/a	n/a
	T2	4,67	$10^{4,67}$	2,90 x 10^5	5,46	n/a	n/a

VISMEDERI TEXTYLE

Test report n° 2100031/01

	Time	Average Log $TCID_{50}$	$TCID_{50}$ /1 ml	N ($TCID_{50}/cm^2$)	At	R |Ut-At|	[% reduction versus T0]
Treated Sample	T1	4,50	$10^{4,50}$	$1,98 \times 10^5$	5,30	0,25	78,62
	T2	3,83	$10^{3,83}$	$4,26 \times 10^4$	4,63	0,83	95,43

This Test Report refers only to the sample tested; the name and description of the sample are declared by the Customer.
This test report may only be reproduced in full; partial reproduction must be authorized with written approval by the Laboratory.
° Test in service (same Group).

Prato, 08 April 2021

End of test Report

The Responsible,

Vismederi Textyle S.r.l.
Via Natale Ciampi, 5 - 59100 Prato (Italia) P.IVA: 02475990970
Phone: +39 3392017790 fax: +39 0574 465779
vismederitextyle@gmail.com vismederitextyle@pec.it

LAB N°0006 L

RAPPORTO DI CLASSIFICAZIONE / CLASSIFICATION REPORT

NUMERO / NUMBER	DATA DI EMISSIONE / EMISSION DATE
0684\DC\REA\21_3	22/06/2021

BUSINESS AREA	LABORATORIO / LABORATORY
BA Product Conformity Assessment	Reaction to Fire

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE / SPECIMEN DESCRIPTION

CAST FILM AUTOADESIVO SERIE AV/*

CLIENTE / CUSTOMER

A.P.A S.p.A
VIA MARRADI, 1
20123 MILANO

NORMA DI RIFERIMENTO / REFERENCE STANDARD

EN 13501-1:2019 - Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests

CSI S.P.A. A SOCIO UNICO
SOGGETTA AD ATTIVITÀ DI DIREZIONE E
COORDINAMENTO DI IMQ GROUP S.R.L.

REA MI 1466310
R.I./C.F./P.I. 11360160151
Cap. Soc. € 1.040.000

Sede legale
Italia | 20030 Senago (MI) | Cascina Traversagna 21
direzione-csi@legalmail.it | info@csi-spa.com | www.csi-spa.com

1. Dati generali / General data

Identificazione delle norme di riferimento / Standard reference identification:

- EN 13501-1:2019 - Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests.
- EN ISO 11925-2:2010 Reaction to fire tests for building products - part. 2 -ignitability when subjected to direct impingement of flame.
- EN 13823:2010+A1:2014 - Reaction to fire tests for building products _ Building products excluding floorings exposed to the thermal attack by a single burning item.

2. Identificazione delle procedure / Procedures identification

Deviazione dai metodi di prova/ NO/NO
Deviations from test methods:

3. Dettagli del prodotto classificato / Details of classified product

3.1. Natura e impiego / Nature and end use application :

Il prodotto CAST FILM AUTOADESIVO SERIE AV/* è definito come un rivestimento murale decorativo. La sua classificazione è valida per le seguenti condizioni di impiego:
The product CAST FILM AUTOADESIVO SERIE AV/* is defined as an decorative wallcovering. Its classification is valid for the following end use application(s):

- Parete – incollato su supporto incombustibile o cartongesso
- Wall – glued on non combustible backing or gypsum plasterboard
- Copertura – incollato su supporto incombustibile o cartongesso
- Ceiling – glued on non combustible backing or gypsum plasterboard

3.2. Descrizione / Description :

Il prodotto CAST FILM AUTOADESIVO SERIE AV/* è compiutamente descritto nei rapporti di prova in sussidio della classificazione elencati in 5.1
The product CAST FILM AUTOADESIVO SERIE AV/* is fully described in the test reports in support of the classification listed in 5.1.

4. Dichiarazioni / Statements

- Questo rapporto di classificazione definisce la classificazione assegnata al prodotto indicato in copertina secondo le procedure stabilite nella norma EN 13501-1.
  This classification report defines the classification assigned to the product mentioned on the cover in accordance with the procedures given in EN 13501-1.
- I risultati di prova contenuti nel presente rapporto di classificazione si riferiscono esclusivamente al campione provato
  Test results contained in this classification report relate only to the specimens tested.
- Il presente rapporto di prova non può essere riprodotto parzialmente senza l'autorizzazione del Responsabile di Laboratorio
  test report shall not be reproduced except in full without the written approval of the Managing Director.

5. Rapporti di prova e risultati di prova in supporto di questa classificazione / Test reports and test results in support of this classification

5.1. Rapporti di prova / test reports

Nome del laboratorio / Name of laboratory	Nome del Committente / Name of sponsor	Numero di Identificazione del rapporto di prova / Test report ref. No.	Metodo di prova / test method
CSI S.p.A.	A.P.A S.p.A.	0684/DC/REA/21_1	EN 13823
CSI S.p.A.	A.P.A S.p.A.	0684/DC/REA/21_2	EN ISO 11925-2

5.2. Risultati di prova per prodotti da costruzione esclusi i pavimenti / Test results for construction products except floorings

Metodo di prova / Test method	Parametro / Parameter	Numero di prove / Number of tests	Risultati / Results	
			Parametri continui media / Continuous parameter average	Parametri di conformità / Compliance parameter
EN ISO11925-2 Attacco della fiamma in superficie Surface flame attack Applicazione 30 s / 30 s exposure	Fs ≤ 150 mm	6	(-)	S / Y
Attacco della fiamma all'estremità Edge flame attack Applicazione 30 s / 30 s exposure	Fs ≤ 150 mm	6	(-)	S / Y
Gocce/parti accese / Flamig droplets/particle	Innesco della carta da filtro/ Ignition of the filter paper	12	(-)	S / Y
EN 13823	FIGRA $_{0,2MJ}$	3	0	(-)
	FIGRA $_{0,4MJ}$		0	(-)
	LFS < Edge		(-)	S / Y
	THR_{600s} [MJ]		0,8	(-)
	SMOGRA [m^2/s^2]	3	0	(-)
	TSP_{600s} [m^2]		22,9	(-)
	Gocce/parti accese Flaming droplets/ particles	3	(-)	S / Y

6. Classificazione e campo diretto di applicazione / Classification and direct field of application

6.1. Riferimenti e campo diretto di applicazione / Reference and direct field of application

Questa classificazione è stata condotta conformemente alla clausola 8.2 della EN 13501-1:2019.
This classification has been carried out in accordance with clause 8.2 of EN 13501-1: 2019.

6.2. Classificazione / Classification

Il prodotto CAST FILM AUTOADESIVO SERIE AV/* in relazione al suo comportamento alla reazione al fuoco è classificato:
The product CAST FILM AUTOADESIVO SERIE AV/*in relation to its fire reaction behaviour is classified:

B

La classificazione aggiuntiva in relazione allo sviluppo di fumo è:
The additional classification in relation to smoke production is:

s1

La classificazione aggiuntiva in relazione alle gocce/particelle accese è:
The additional classification in relation to flaming droplets/particles is:

d0

Il formato per la classificazione di reazione al fuoco per i prodotti da costruzione eccetto i pavimenti è la seguente:
The format of the reaction to fire classification for construction products except flooring is:

Comportamento al fuoco Fire behaviour		Sviluppo di fumo Smoke production			Parti infiammate Flaming droplets	
B	**-**	**s**	**1**	**-**	**d**	**0**

6.3. Campo di applicazione / Field of application

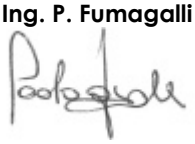
Questa classificazione è valida per le seguenti condizioni di impiego /
This classification is valid for the following end use conditions:

– Incollato su supporto / appoggio incombustibile o cartongesso
Glued on non combustible or gypsum plasterboard support / backing

7. Limitazioni / Limitations

7.1. Avvertimento / Warning

Questo documento non rappresenta un'approvazione di tipo od una certificazione del prodotto
This document does not represent type approval or certification of the product.

DATA ***Date***	**Operating Sector Reaction to Fire** ***Operating Sector Reaction to Fire***	**BA Product Conformity Assessment** ***BA Product Conformity Assessment***
	Dr. Lorenzo Zavaglio	**Ing. P. Fumagalli**
22/06/2021		

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LAB N°0006 L

RAPPORTO DI PROVA / *TEST REPORT*

NUMERO / NUMBER

0077\DC\TOX\21

DATA DI EMISSIONE / EMISSION DATE

15/07/2021

BUSINESS AREA

BA Product Conformity Assessment

LABORATORIO / LABORATORY

Reaction to Fire

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE / SPECIMEN DESCRIPTION

SERIE SX*, AP/6*, L/11*, XF*, S/*, FS/*, AP/HT*. HT*, AB/*, AV/*

CLIENTE / CUSTOMER

A.P.A. SPA
VIA RUFFILLI, 6
20060 PESSANO CON BORNAGO (MI)

NORMA DI RIFERIMENTO / REFERENCE STANDARD

EN 45545-2:2013 + A1:2015 - ISO 5659-2:2017

CSI S.P.A. A SOCIO UNICO
SOGGETTA AD ATTIVITÀ DI DIREZIONE E
COORDINAMENTO DI IMQ GROUP S.R.L.

REA MI 1466310
R.I./C.F./P.I. 11360160151
Cap. Soc. € 1.040.000

Sede legale
Italia | 20030 Senago (MI) | Cascina Traversagna 21
direzione-csi@legalmail.it | info@csi-spa.com | www.csi-spa.com

Dati generali / General data

Data ricevimento campione / Date of test specimen arrival:	22/06/2021
Data accettazione campione /Date of test specimen acceptance:	22/06/2021
Data inizio prove / Test beginning date:	13/07/2021
Data fine prove / Test end date:	13/07/2021
Luogo di prova/ Test site:	Viale Lombardia, 20, 20021 Bollate (MI) Italia
Deviazione dai metodi di prova/ Deviations from test methods:	NO/NO

Campionamento/Sampling

Il campionamento e il prelievo iniziali sono stati eseguiti dal Committente della prova. / The initial sampling has been done by the customer.

Campioni analizzati / Samples tested:

3 Provette campione denominate / 3 Specimens of sample identified:
SERIE SX*, AP/6*, L/11*, XF*, S/*, FS/*, AP/HT*. HT*, AB/*, AV/*

Descrizione	:	Pellicola autoadesiva IN PVC.
Description	:	PVC self-adhesive film.
Massa areica / Mass per area unit	:	130 g/m^2
Spessore / Thickness	:	0,1 mm

Tipo di substrato / Substrate type:

Lastra in acciaio come da EN 45545-2:2013+A1:2015 tabella 7
Steel sheet according to EN 45545-2:2013+A1:2015 Table 7

Allestimento del campione / Specimen mounting and fixing:
Appoggiato su substrato.
Loose laid on substrate.

Dichiarazioni / Declaration

I risultati di prova contenuti nel presente rapporto si riferiscono esclusivamente al campione provato / Test results contained in this test report pertain exclusively to the tested specimen

Il presente rapporto non può essere riprodotto parzialmente senza l'autorizzazione del Responsabile del Centro / This test report cannot be reproduced partially without the consent of the test center managing director

I dati tecnici riportati nella descrizione del campione sono desunti dalla scheda tecnica allegata dal cliente al campione di prova. / The technical data reported on the specimen description are taken from client technical sheet.

Risultati / Results:

Metodo di prova / Test method: ISO 5659-2:2017

	NON FLAMING 50 KW/m²		
Campione / Specimen N°	D_{4min}	D_{max}	VOF4
1	68,8	96,2	235,0
2	56,4	78,8	191,7
3	59,7	82,9	204,8
Media / Average	**61,6**	**86,0**	**210,5**

Metodo di prova / Test method: EN 45545-2:2013+A1:2015 Annex C Method 1

GAS	CONCENTRAZIONE 240 s CONCENTRATION 240 s ppm	CONCENTRAZIONE 480 s CONCENTRATION 480 s ppm
ANIDRIDE CARBONICA CARBON DIOXIDE	1073	1127
OSSIDO DI CARBONIO CARBON MONOXIDE	90	160
ACIDO CLORIDRICO HYDROGEN CLORIDE	< 0,1	< 0,1
ACIDO BROMIDRICO HYDROGEN BROMIDE	< 0,1	< 0,1
ACIDO FLUORIDRICO HYDROGEN FLUORIDE	< 0,1	< 0,1
ACIDO CIANIDRICO HYDROGEN CIANIDE	< 0,1	< 0,1
OSSIDI DI AZOTO NITROGEN OXIDES	< 0,1	< 0,1
ANIDRIDE SOLFOROSA SULPHUR DIOXIDE	< 0,1	< 0,1

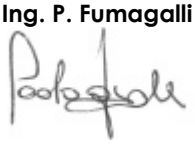
NON FLAMING 50 KW/m2	
CIT 240s	CIT 480s
0,008	0,013

Il prodotto **è conforme** alla norma EN 45545-2:2013+A1:2015 requisiti **R1** e **R7**

per HL1 e HL2 per le prove **T10.01**, **T10.02**, **T10.04** e **T11.01**

The product **complies** with the tests **T10.01**, **T10.02**, **T10.04** and **T11.01** requirements **R1** and **R7**

for HL1 and HL2 of standard EN 45545-2:2013+A1:2015

DATA ***Date***	**Operating Sector Reaction to Fire** ***Operating Sector Reaction to Fire***	**BA Product Conformity Assessment** ***BA Product Conformity Assessment***
	Dr. Lorenzo Zavaglio	**Ing. P. Fumagalli**
15/07/2021		

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LAB N°0006 L

RAPPORTO DI PROVA / *TEST REPORT*

NUMERO / NUMBER

0873\DC\REA\21

DATA DI EMISSIONE / EMISSION DATE

15/07/2021

BUSINESS AREA

BA Product Conformity Assessment

LABORATORIO / LABORATORY

Reaction to Fire

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE / SPECIMEN DESCRIPTION

SERIE SX*, AP/6*, L/11*, XF*, S/*, FS/*, AP/HT*. HT*, AB/*, AV/*

CLIENTE / CUSTOMER

A.P.A. SPA
VIA RUFFILLI, 6
20060 PESSANO CON BORNAGO (MI)

NORMA DI RIFERIMENTO / REFERENCE STANDARD

ISO 5658-2:2006+A1:2011 - Reaction-to-fire tests – Spread of flame – Part 2: Lateral spread on building products in vertical configuration

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REA MI 1466310
R.I./C.F./P.I. 11360160151
Cap. Soc. € 1.040.000
Sede legale
Italia | 20030 Senago (MI) | Cascina Traversagna 21
direzione-csi@legalmail.it | info@csi-spa.com | www.csi-spa.com

Dati generali / General data

Data ricevimento campione / Date of test specimen arrival:	22/06/2021
Data accettazione campione /Date of test specimen acceptance:	22/06/2021
Data inizio prove / Test beginning date:	13/07/2021
Data fine prove / Test end date:	13/07/2021
Luogo di prova/ Test site:	Viale Lombardia, 20, 20021 Bollate (MI) Italia
Deviazione dai metodi di prova/ Deviations from test methods:	NO/NO

Campionamento/Sampling

Il campionamento e il prelievo iniziali sono stati eseguiti dal Committente della prova. / The initial sampling has been done by the customer.

Campioni analizzati / Samples tested:

6 Provette campione denominate / 6 Specimens of sample identified:
SERIE SX*, AP/6*, L/11*, XF*, S/*, FS/*, AP/HT*. HT*, AB/*, AV/*

Descrizione	:	Pellicola autoadesiva IN PVC.
Description	:	PVC self-adhesive film.
Massa areica / Mass per area unit	:	130 g/m^2
Spessore / Thickness	:	0,1 mm

Tipo di substrato / Substrate type:
Lastra in acciaio conforme alla tabella 7 della norma EN 45545-2:2013+A1:2015.
Stell sheet complying to table 7 of the EN 45545-2:2013+A1:2015 standard.
Allestimento del campione / Specimen mounting and fixing:
Incollato su substrato.
Glued on substrate

Condizionamento secondo EN 13238	:	23 °C - 50 % u.r. fino a massa costante
Conditioning compliing EN 13238	:	23 °C - 50 % r.h. until constant mass

Dichiarazioni / Statement

I risultati di prova contenuti nel presente rapporto si riferiscono esclusivamente al campione provato / Test results contained in this test report pertain exclusively to the tested specimen

Il presente rapporto non può essere riprodotto parzialmente senza l'autorizzazione del Responsabile del Centro / This test report cannot be reproduced partially without the consent of the test center managing director

I dati tecnici riportati nella descrizione del campione sono desunti dalla scheda tecnica allegata dal cliente al campione di prova. / The technical data reported on the specimen description are taken from client technical sheet.

Risultati / Results:

ISO 5658-2:2006+A1:2011

Senso longitudinale / Machine direction

Identificazione della provetta/ Specimen identification	N. 1	N. 2	N. 3	**Media Average**
Tempo di innesco / Ignition time [s]	24	19	14	**19**
Tempo di spegnimento / Flame out time [s]	64	69	49	**61**
Zona danneggiata / Extent of burn [mm]	290	300	300	**297**
Durata della prova / Test duration [s]	600	600	600	**600**
Calore medio per la combustione sostenuta / Average heat for substained burning [MJ/m^2]	1,34	0,97	0,83	**1,05**
Flusso di calore critico allo spegnimento Critical heat flux at extinguishment CFE [KW/m^2]	31,2	30,0	30,0	**30,4**

Senso trasversale / Cross direction

Identificazione della provetta/ Specimen identification	N. 1	N. 2	N. 3	**Media Average**
Tempo di innesco / Ignition time [s]	19	23	13	**18**
Tempo di spegnimento / Flame out time [s]	82	66	48	**65**
Zona danneggiata / Extent of burn [mm]	275	300	300	**292**
Durata della prova / Test duration [s]	600	600	600	**600**
Calore medio per la combustione sostenuta / Average heat for substained burning [MJ/m^2]	1,35	1,23	1,03	**1,20**
Flusso di calore critico allo spegnimento Critical heat flux at extinguishment CFE [KW/m^2]	32,9	30,0	30,0	**31,0**

0873\DC\REA\21	15/07/2021

Il prodotto **è conforme** alla norma EN 45545-2:2013+A1:2015 requisiti **R1** e **R7** per HL1, HL2 e HL3 per la prova **T02**

The product **complies** with the test **T02** requirement **R1** and **R7** for HL1, HL2 and HL3 of standard EN 45545-2:2013+A1:2015

DATA ***Date***	**Operating Sector Reaction to Fire** ***Operating Sector Reaction to Fire***	**BA Product Conformity Assessment** ***BA Product Conformity Assessment***
	Dr. Lorenzo Zavaglio	**Ing. P. Fumagalli**
15/07/2021		

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LAB N°0006 L

RAPPORTO DI PROVA / *TEST REPORT*

NUMERO / NUMBER

0873\DC\REA\21_2

DATA DI EMISSIONE / EMISSION DATE

15/07/2021

BUSINESS AREA

BA Product Conformity Assessment

LABORATORIO / LABORATORY

Reaction to Fire

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE / SPECIMEN DESCRIPTION

SERIE SX*, AP/6*, L/11*, XF*, S/*, FS/*, AP/HT*. HT*, AB/*, AV/*

CLIENTE / CUSTOMER

A.P.A. SPA
VIA RUFFILLI, 6
20060 PESSANO CON BORNAGO (MI)

NORMA DI RIFERIMENTO / REFERENCE STANDARD

ISO 5660-1:2015 - Reaction-to-fire tests – Heat release, smoke production and mass loss rate

CSI S.P.A. A SOCIO UNICO
SOGGETTA AD ATTIVITÀ DI DIREZIONE E
COORDINAMENTO DI IMQ GROUP S.R.L.

REA MI 1466310
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Data fine prove / Test end date:	13/07/2021
Luogo di prova/ Test site:	Viale Lombardia, 20, 20021 Bollate (MI) Italia
Deviazione dai metodi di prova/ Deviations from test methods:	NO/NO

Campionamento/Sampling

Il campionamento e il prelievo iniziali sono stati eseguiti dal Committente della prova. / The initial sampling has been done by the customer.

Campioni analizzati / Samples tested:

3 Provette campione denominate / 3 Specimens of sample identified:
SERIE SX*, AP/6*, L/11*, XF*, S/*, FS/*, AP/HT*. HT*, AB/*, AV/*

Descrizione	:	Pellicola autoadesiva IN PVC.
Description	:	PVC self-adhesive film.
Massa areica / Mass per area unit	:	130 g/m^2
Spessore / Thickness	:	0,1 mm

Tipo di substrato / Substrate type:
Lastra in acciaio conforme alla tabella 7 della norma EN 45545-2:2013+A1:2015.
Stell sheet complying to table 7 of the EN 45545-2:2013+A1:2015 standard.
Allestimento del campione / Specimen mounting and fixing:
Incollato su substrato.
Glued on substrate.

Condizionamento secondo EN 13238	:	23 °C - 50 % u.r. fino a massa costante
Conditioning compliing EN 13238	:	23 °C - 50 % r.h. until constant mass

Dichiarazioni / Statement

I risultati di prova contenuti nel presente rapporto si riferiscono esclusivamente al campione provato / Test results contained in this test report pertain exclusively to the tested specimen

Il presente rapporto non può essere riprodotto parzialmente senza l'autorizzazione del Responsabile del Centro / This test report cannot be reproduced partially without the consent of the test center managing director

I dati tecnici riportati nella descrizione del campione sono desunti dalla scheda tecnica allegata dal cliente al campione di prova. / The technical data reported on the specimen description are taken from client technical sheet.

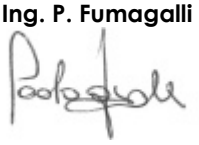
Risultati / Results:

Metodo di prova / Test method: ISO 5660-1

PROVINO N° / SPECIMEN N°	1	2	3	**Media Average**
Preparazione del provino / Specimen preparation	Presenza del telaio di contenimento / Retainer frame presence			-
Area della superficie del provino / Specimen surface area [cm²]	88,4	88,4	88,4	**88,4**
Costante di calibrazione C della velocità del flusso nel condotto / Orifice flow rate calibration costant C	0,0419	0,0419	0,0419	**0,0419**
Irraggiamento / Heat flux [kW/m²]	50	50	50	**50**
Velocità del flusso nel condotto di estrazione / Exhaust system flow rate [m³/s]	0,024	0,024	0,024	**0,024**
Tempo di innesco / Time to ignition [s]	50	55	51	**52**
Tempo estinzione fiamma / Flameout [s]	72	109	116	**99**
Tempo di durata della prova / Test end time [s]	1200	1200	1200	**1200**
Valore medio nei primi 180 s dopo l'innesco / Average values for the first 180 s after ignition [kW/m²]	4,98	3,00	11,5	**6,5**
Calore totale rilasciato / Total heat release [MJ/m²]	1,1	1,3	2,3	**1,6**
Picco del tasso di rilascio di calore / Heat release rate peak [kW/m²]	25,5	28,5	37,8	**30,6**
Tasso di rilascio di calore medio / Average heat release rate [kW/m²]	2,6	0,9	19,7	**7,7**
Massima emissione media di calore / Maximum Average Heat Emission (MAHRE) [kW/m²]	8,5	6,5	18,8	**11,3**

Il prodotto **è conforme** alla norma EN 45545-2:2013+A1:2015 requisiti **R1** e **R7** per HL1, HL2 e HL3 per la prova **T03.01**

The product **complies** with the test **T03.01** requirements **R1** and **R7** for HL1, HL2 and HL3 of standard EN 45545-2:2013+A1:2015

DATA ***Date***	**Operating Sector Reaction to Fire** ***Operating Sector Reaction to Fire***	**BA Product Conformity Assessment** ***BA Product Conformity Assessment***
	Dr. Lorenzo Zavaglio	**Ing. P. Fumagalli**
15/07/2021		

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