Alcalá la Real, December 2020

ANTIBACTERIAL DECLARATION

To whom it may concern

According to the study supplied by IMSL -INDUSTRIAL MICROBIOLOGICAL SERVICES LTD (independent testing and consultancy service specialized in the microbiology of industrial processes and products), which determines the Antibacterial Activity of Polypropylene Film Treated with Antimicrobial Agents against Escherichia coli and Staphylococcus aureus, using ISO 22196, TAGHLEEF INDUSTIRES S.L. declares that the Graphic Arts range of Antibacterial films (F138, F148, F238, F248, D238 and D248) containing in their composition a tested antimicrobial additive and in the percentage recommended by the raw material supplier, achieve an antimicrobial efficiency higher than 99 % (reduction Antibacterial activity) based on ISO 22196.

This certificate was tested using F238 film. The rest of films claimed in this certificate contain at least the same quantity of antimicrobial additive in their surface composition, so the antibacterial properties of our films can be confirmed with an efficiency more than 99 %.

These films also show antiviral properties under ISO 21702:2019. The reduction of virus on the surface of the films reaches 65% (tested on coronavirus type virus) after 2 hours of exposition (According to the study supplied by MICROBIOLOGICAL SOLUTIONS LTD).

The laboratory test results can be consulted in the annex.

Antibacterial Declaration		
Date: 10.12.2020	Approved by: R&D Director Javier del Barrio	Page 1 of 2

Annex: Laboratory test results

Antibacterial laboratory test report

Results provided by IMSL (Industrial Microbiological Services LTD). Results as (CFU CM)$^{-2}$

Sample	Species	Contact Time		Reduction (Control)	
		0 hrs	24 hrs	Log 10	%
Control – F230	*E coli*	*1.6E+04*	*6.8E+03*		
Treated – F238	*E coli*	*1.6E+04*	*<11.11*	*≥2.79*	*≥99.84 %*
Control – F230	*MRSA*	*1.1E+04*	*4.5E+03*		
Treated – F238	*MRSA*	*1.1E+04*	*<11.11*	*≥2.61*	*≥99.75 %*

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 control sample.

Antiviral laboratory test report

Results provided by MSL (Microbiological Solutions LTD).

Sample	Type of virus	Contact Time	Reduction (Control)	
			Log 10	%
F238	*Coronavirus*	*2 hrs*	*0.46*	*65.32 %*
		12 hrs	*0.58*	*73.69 %*

The above data was measured with a temperature of incubation of 37 °C.

All recovery and log reduction calculations were performed for TCID50 rather than plaque assays.