

# CLIMATE DECLARATION FOR ARCHITECTURAL SOLAR CONTROL WINDOW FILMS

Functional unit: 1 square meter of film, installed for 15 years

The climate declaration shows the emissions of greenhouse gases, expressed as CO<sub>2</sub>-equivalents. It is based on verified results from a lifecycle assessment (LCA) performed in accordance with ISO 14025.

## Product

Solar Gard® and Panorama® architectural solar control window films are used in commercial and residential buildings to save energy, improve comfort, protect views and harness daylight while reducing solar heat gain.



These window films are made of complex layers of various coated materials that control how the sun's radiation passes through glass. Proprietary combinations of metals such as stainless steel, gold, silver, aluminum and other alloys give each of the 32 films studied in this report its unique solar performance capability and color. Solar Gard and Panorama window films range in color from optically clear to bronze, gray, silver or black and are professionally installed by retrofitting them to the inside surface of glass to improve solar performance. Solar Gard and Panorama also carry solar control exterior, safety and security films; they were not included in this analysis.

## Company

Solar Gard, a division of Saint-Gobain (SGSG,) manufactures and distributes window films that provide solar control, energy saving and CO<sub>2</sub> emission reduction, safety, security and glare reduction solutions for architectural and automotive applications. They are sold in 60 countries worldwide under the Solar Gard®, Panorama® and Quantum® brands. Solar Gard also manufactures films for the photovoltaic, electronics, medical, graphic arts and imaging industries. Committed to environmentally responsible manufacturing, Solar Gard works with the Clinton Climate Initiative to reduce carbon dioxide emissions, has certified the carbon footprint of its manufacturing to earn the title of Climate Action Leader, and its manufacturing facility is ISO 14000:2004 and ISO

9001:2008 certified. Headquartered in San Diego, Solar Gard is a technological leader in advanced metal transformation and advanced materials and coatings.

## Climate declaration

A complete lifecycle analysis was conducted on the entire manufacturing process, including raw materials, manufacturing, distribution, use phase and disposal. The attached tables (1-12) provide evidence on how Solar Gard and Panorama window films produce a net carbon reduction in greenhouse gases.

## Other environmental information

More information about the products and their complete environmental performance are presented in the Environmental Product Declaration at [www.environdec.com](http://www.environdec.com).

## Contact

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4540 Viewridge Avenue, San Diego, CA.

Phone: (858) 576-0200

Contact: Product Marketing

[www.solargard.com](http://www.solargard.com)



[www.panoramafilm.com](http://www.panoramafilm.com)



LINK TO MORE INFORMATION: [WWW.CLIMATEDEC.COM/207](http://WWW.CLIMATEDEC.COM/207)

EPD PROGRAMME: THE INTERNATIONAL EPD®SYSTEM

REGISTRATION NO: S-P-00207

PCR: 2006:02

PCR REVIEW CONDUCTED BY: THE TECHNICAL COMMITTEE OF THE INTERNATIONAL EPD®SYSTEM

INDEPENDENT VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025:  
EXTERNAL VERIFIER: CARL-OTTO NEVÉN, FIVE WINDS INTERNATIONAL

ACCREDITED / APPROVED BY:  
THE INTERNATIONAL EPD®SYSTEM

CLIMATE DECLARATIONS FROM DIFFERENT PROGRAMS MAY NOT BE COMPARABLE

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VALIDITY: 2012-11-17

**TABLE 1: EMBODIED CO2E & NET CO2E SAVINGS IN NORTH AMERICA**

15 Year Lifecycle (kg CO2e / Meter^2)			All Films		Autumn Bronze 30			Bronze Silver 15			Bronze Silver 20			Bronze Silver Bronze 10			Grey Silver 15			Grey Silver Grey 10			Hilite 70			Quantum Silver Quantum 10			Quantum Silver Quantum 20			Silver 20			Silver 35			Silver 50				
			Transportation to Customer	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved						
North America	ASHRAE Climate Zone 1,2	36"	0.002	0.40	0.009	896	0.35	0.008	1,462	0.35	0.008	1,200	0.40	0.008	1,295	0.35	0.008	1,378	0.40	0.008	1,285	-	-	-	0.40	0.008	1,351	0.40	0.008	1,034	0.35	0.008	1,367	0.34	0.008	1,165	0.34	0.008	826			
		48"	0.002	0.33	0.009	896	0.29	0.008	1,463	0.29	0.008	1,201	0.30	0.008	1,296	0.29	0.008	1,379	0.30	0.008	1,286	0.71	0.008	908	0.30	0.008	1,352	0.34	0.008	1,035	0.29	0.008	1,368	0.29	0.008	1,166	0.28	0.008	826			
		60"	0.002	0.29	0.009	897	0.26	0.008	1,463	0.26	0.008	1,201	0.27	0.008	1,296	0.26	0.008	1,379	0.27	0.008	1,286	0.59	0.008	910	0.27	0.008	1,353	0.29	0.008	1,035	0.26	0.008	1,368	0.25	0.008	1,166	0.25	0.008	827			
		72"	0.002	0.27	0.009	897	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	1,353	0.27	0.008	1,036	0.30	0.008	1,368	0.30	0.008	1,166	0.26	0.008	827			
	ASHRAE Climate Zone 3	36"	0.002	0.40	0.009	856	0.35	0.008	1,365	0.35	0.008	1,136	0.40	0.008	1,222	0.35	0.008	1,293	0.40	0.008	1,215	-	-	-	0.40	0.008	1,273	0.40	0.008	988	0.35	0.008	1,306	0.34	0.008	1,103	0.34	0.008	789			
		48"	0.002	0.33	0.009	857	0.29	0.008	1,366	0.29	0.008	1,137	0.30	0.008	1,223	0.29	0.008	1,294	0.30	0.008	1,216	0.71	0.008	860	0.30	0.008	1,274	0.34	0.008	989	0.29	0.008	1,307	0.29	0.008	1,104	0.28	0.008	789			
		60"	0.002	0.29	0.009	858	0.26	0.008	1,366	0.26	0.008	1,137	0.27	0.008	1,223	0.26	0.008	1,294	0.27	0.008	1,216	0.59	0.008	861	0.27	0.008	1,274	0.29	0.008	989	0.26	0.008	1,307	0.25	0.008	1,104	0.25	0.008	789			
		72"	0.002	0.27	0.009	858	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	1,274	0.27	0.008	990	0.30	0.008	1,307	0.30	0.008	1,104	0.26	0.008	789			
	ASHRAE Climate Zone 4	36"	0.002	0.40	0.009	485	0.35	0.008	745	0.35	0.008	693	0.40	0.008	677	0.35	0.008	709	0.40	0.008	661	-	-	-	0.40	0.008	690	0.40	0.008	548	0.35	0.008	705	0.34	0.008	616	0.34	0.008	448			
		48"	0.002	0.33	0.009	486	0.29	0.008	746	0.29	0.008	694	0.30	0.008	678	0.29	0.008	710	0.30	0.008	662	0.71	0.008	483	0.30	0.008	691	0.34	0.008	549	0.29	0.008	706	0.29	0.008	617	0.28	0.008	448			
		60"	0.002	0.29	0.009	486	0.26	0.008	746	0.26	0.008	694	0.27	0.008	678	0.26	0.008	710	0.27	0.008	663	0.59	0.008	485	0.27	0.008	691	0.29	0.008	550	0.26	0.008	706	0.25	0.008	617	0.25	0.008	449			
		72"	0.002	0.27	0.009	487	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	692	0.27	0.008	550	0.30	0.008	706	0.30	0.008	617	0.26	0.008	449			
	ASHRAE Climate Zone 5	36"	0.002	0.40	0.009	561	0.35	0.008	566	0.35	0.008	477	0.40	0.008	502	0.35	0.008	529	0.40	0.008	492	-	-	-	0.40	0.008	502	0.40	0.008	390	0.35	0.008	602	0.34	0.008	501	0.34	0.008	387			
		48"	0.002	0.33	0.009	562	0.29	0.008	567	0.29	0.008	478	0.30	0.008	503	0.29	0.008	529	0.30	0.008	493	0.71	0.008	427	0.30	0.008	503	0.34	0.008	391	0.29	0.008	603	0.29	0.008	501	0.28	0.008	388			
		60"	0.002	0.29	0.009	562	0.26	0.008	567	0.26	0.008	478	0.27	0.008	504	0.26	0.008	530	0.27	0.008	494	0.59	0.008	429	0.27	0.008	503	0.29	0.008	391	0.26	0.008	603	0.25	0.008	502	0.25	0.008	388			
		72"	0.002	0.27	0.009	563	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	503	0.27	0.008	392	0.30	0.008	603	0.30	0.008	501	0.26	0.008	388			
	ASHRAE Climate Zone 6,7	36"	0.002	0.40	0.009	477	0.35	0.008	525	0.35	0.008	462	0.40	0.008	470	0.35	0.008	493	0.40	0.008	457	-	-	-	0.40	0.008	465	0.40	0.008	360	0.35	0.008	566	0.34	0.008	468	0.34	0.008	360			
		48"	0.002	0.33	0.009	477	0.29	0.008	526	0.29	0.008	463	0.30	0.008	471	0.29	0.008	494	0.30	0.008	458	0.71	0.008	397	0.30	0.008	466	0.34	0.008	361	0.29	0.008	567	0.29	0.008	469	0.28	0.008	361			
		60"	0.002	0.29	0.009	478	0.26	0.008	526	0.26	0.008	463	0.27	0.008	471	0.26	0.008	494	0.27	0.008	458	0.59	0.008	399	0.27	0.008	466	0.29	0.008	361	0.26	0.008	567	0.25	0.008	469	0.25	0.008	361			
		72"	0.002	0.27	0.009	479	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	467	0.27	0.008	362	0.30	0.008	567	0.30	0.008	469	0.26	0.008	361			
	Canada	36"	0.007	0.40	0.009	-61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
		48"	0.007	0.33	0.009	-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.71	0.008	-45	-	-	-	-	-	-	-	0.29	0.008	-88	0.29	0.008	-53	0.28	0.008	-31
		60"	0.007	0.29	0.009	-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.59	0.008	-43	-	-	-	-	-	-	-	0.26	0.008	-88	0.25	0.008	-52	0.25	0.008	-31
		72"	0.007	0.27	0.009	-59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	-88	0.30	0.008	-53	0.26	0.008	-31	
	Mexico	36"	0.002	-	-	-	0.35	0.008	696	0.35	0.008	581	-	-	-	0.35	0.008	657	0.40	0.008	630	-	-	-	-	-	-	-	-	-	-	-	0.35	0.008	649	0.34	0.008	559	0.34	0.008	411	
		48"	0.002	-	-	-	0.29	0.008	697	0.29	0.008	582	-	-	-	0.29	0.008	658	0.30	0.008	631	0.71	0.008	436	-	-	-	-	-	-	-	-	0.29	0.008	650	0.29	0.008	560	0.28	0.008	412	
		60"	0.002	-	-	-	0.26	0.008	697	0.26	0.008	582	-	-	-	0.26	0.008	658	0.27	0.008	632	0.59	0.008	437	-	-	-	-	-	-	-	-	0.26	0.008	650	0.25	0.008	560	0.25	0.008	412	
		72"	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	650	0.30	0.008	560	0.26	0.008	412		

**TABLE 2: EMBODIED CO2E & NET CO2E SAVINGS IN NORTH AMERICA (CONT.)**

15 Year Lifecycle (kg CO2e / Meter^2)			All Films		Silver AG 25 Low-e			Slate 10			Slate 20			Slate 30			Slate 40			Slate 50			Solar Bronze 20			Solar Bronze 35			Solar Bronze 50		
			Transportation to Customer	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	
North America	ASHRAE Climate Zone 1,2	36"	0.002	0.36	0.008	1,407	0.41	0.009	1,531	0.40	0.009	1,299	0.40	0.009	1,136	0.39	0.009	887	0.34	0.008	885	0.35	0.008	1,367	0.34	0.008	1,165	0.34	0.008	1,095	
		48"	0.002	0.30	0.008	1,408	0.35	0.009	1,532	0.33	0.009	1,300	0.33	0.009	1,137	0.32	0.009	887	0.28	0.008	886	0.29	0.008	1,368	0.29	0.008	1,166	0.28	0.008	1,095	
		60"	0.002	0.26	0.008	1,408	0.30	0.009	1,532	0.29	0.009	1,301	0.29	0.009	1,137	0.28	0.009	888	0.25	0.008	886	0.26	0.008	1,368	0.25	0.008	1,166	0.25	0.008	1,096	
		72"	0.002	-	-	-	0.28	0.009	1,532	0.27	0.009	1,301	0.27	0.009	1,137	0.27	0.009	888	0.26	0.008	886	0.30	0.008	1,368	0.30	0.008	1,166	0.26	0.008	1,095	
	ASHRAE Climate Zone 3	36"	0.002	0.36	0.008	1,303	0.41	0.009	1,425	0.40	0.009	1,227	0.40	0.009	1,080	0.39	0.009	846	0.34	0.008	846	0.35	0.008	1,385	0.34	0.008	1,205	0.34	0.008	1,039	
		48"	0.002	0.30	0.008	1,304	0.35	0.009	1,426	0.33	0.009	1,228	0.33	0.009	1,080	0.32	0.009	847	0.28	0.008	847	0.29	0.008	1,386	0.29	0.008	1,206	0.28	0.008	1,040	
		60"	0.002	0.26	0.008	1,304	0.30	0.009	1,426	0.29	0.009	1,228	0.29	0.009	1,081	0.28	0.009	848	0.25	0.008	847	0.26	0.008	1,386	0.25	0.008	1,206	0.25	0.008	1,040	
		72"	0.002	-	-	-	0.28	0.009	1,427	0.27	0.009	1,228	0.27	0.009	1,081	0.27	0.009	848	0.26	0.008	847	0.30	0.008	1,386	0.30	0.008	1,206	0.26	0.008	1,040	
	ASHRAE Climate Zone 4	36"	0.002	0.36	0.008	757	0.41	0.009	761	0.40	0.009	663	0.40	0.009	635	0.39	0.009	476	0.34	0.008	476	0.35	0.008	758	0.34	0.008	671	0.34	0.008	582	
		48"	0.002	0.30	0.008	758	0.35	0.009	762	0.33	0.009	664	0.33	0.009	636	0.32	0.009	476	0.28	0.008	476	0.29	0.008	759	0.29	0.008	671	0.28	0.008	583	
		60"	0.002	0.26	0.008	758	0.30	0.009	763	0.29	0.009	664	0.29	0.009	636	0.28	0.009	477	0.25	0.008	477	0.26	0.008	759	0.25	0.008	672	0.25	0.008	583	
		72"	0.002	-	-	-	0.28	0.009	763	0.27	0.009	664	0.27	0.009	636	0.27	0.009	477	0.26	0.008	477	0.30	0.008	759	0.30	0.008	671	0.26	0.008	583	
	ASHRAE Climate Zone 5	36"	0.002	0.36	0.008	591	0.41	0.009	590	0.40	0.009	521	0.40	0.009	469	0.39	0.009	394	0.34	0.008	401	0.35	0.008	596	0.34	0.008	541	0.34	0.008	486	
		48"	0.002	0.30	0.008	592	0.35	0.009	591	0.33	0.009	522	0.33	0.009	470	0.32	0.009	394	0.28	0.008	402	0.29	0.008	597	0.29	0.008	542	0.28	0.008	486	
		60"	0.002	0.26	0.008	592	0.30	0.009	592	0.29	0.009	522	0.29	0.009	470	0.28	0.009	395	0.25	0.008	402	0.26	0.008	597	0.25	0.008	542	0.25	0.008	487	
		72"	0.002	-	-	-	0.28	0.009	592	0.27	0.009	522	0.27	0.009	470	0.27	0.009	395	0.26	0.008	402	0.30	0.008	597	0.30	0.008	542	0.26	0.008	487	
	ASHRAE Climate Zone 6,7	36"	0.002	0.36	0.008	560	0.41	0.009	552	0.40	0.009	484	0.40	0.009	435	0.39	0.009	366	0.34	0.008	374	0.35	0.008	562	0.34	0.008	508	0.34	0.008	455	
		48"	0.002	0.30	0.008	561	0.35	0.009	553	0.33	0.009	485	0.33	0.009	435	0.32	0.009	367	0.28	0.008	375	0.29	0.008	563	0.29	0.008	509	0.28	0.008	456	
		60"	0.002	0.26	0.008	561	0.30	0.009	553	0.29	0.009	485	0.29	0.009	436	0.28	0.009	367	0.25	0.008	375	0.26	0.008	563	0.25	0.008	509	0.25	0.008	456	
		72"	0.002	-	-	-	0.28	0.009	553	0.27	0.009	486	0.27	0.009	436	0.27	0.009	367	0.26	0.008	375	0.30	0.008	563	0.30	0.008	509	0.26	0.008	456	
	Canada	36"	0.007	0.36	0.008	-29	0.41	0.009	-94	0.40	0.009	-69	0.40	0.009	-53	0.39	0.009	-35	0.34	0.008	-33	0.35	0.008	-82	0.34	0.008	-62	0.34	0.008	-47	
		48"	0.007	0.30	0.008	-29	0.35	0.009	-93	0.33	0.009	-69	0.33	0.009	-52	0.32	0.009	-34	0.28	0.008	-33	0.29	0.008	-81	0.29	0.008	-61	0.28	0.008	-46	
		60"	0.007	0.26	0.008	-28	0.30	0.009	-93	0.29	0.009	-68	0.29	0.009	-52	0.28	0.009	-34	0.25	0.008	-32	0.26	0.008	-81	0.25	0.008	-61	0.25	0.008	-46	
		72"	0.007	-	-	-	0.28	0.009	-93	0.27	0.009	-68	0.27	0.009	-52	0.27	0.009	-33	0.26	0.008	-32	0.30	0.008	-81	0.30	0.008	-61	0.26	0.008	-46	
	Mexico	36"	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.008	698	0.34	0.008	606	0.34	0.008	519	
		48"	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	0.008	700	0.29	0.008	607	0.28	0.008	520	
		60"	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.26	0.008	699	0.25	0.008	607	0.25	0.008	520	
		72"	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	699	0.30	0.008	607	0.26	0.008	520	



**TABLE 4: EMBODIED CO2E & NET CO2E SAVINGS IN EUROPE**

15 Year Lifecycle (kg CO2e / Meter^2)		All Films			Autumn Bronze 30			Bronze Silver 15			Bronze Silver 20			Bronze Silver Bronze 10			Grey Silver 15			Grey Silver Grey 10			LX70			Quantum Silver Quantum 10			Quantum Silver Quantum 20			Silver 20			Silver 35			Silver 50		
		Transportation to Customer	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved					
Europe	France	36"	0.088	-	-	-	-	-	0.35	0.008	43	-	-	-	-	-	-	0.40	0.008	38	-	-	-	-	-	-	0.40	0.008	38	-	-	-	-	-	-	-	-			
		48"	0.087	-	-	-	-	-	0.29	0.008	44	-	-	-	-	-	-	0.30	0.008	39	0.71	0.008	20	-	-	-	0.34	0.008	39	-	-	-	-	-	-	-	-			
		60"	0.089	-	-	-	-	-	0.26	0.008	44	-	-	-	-	-	-	0.27	0.008	39	0.59	0.008	22	-	-	-	0.29	0.008	39	-	-	-	-	-	-	-	-	-		
		72"	0.088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	0.008	40	-	-	-	-	-	-	-	-			
	Northern Europe	36"	0.090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.008	534	0.34	0.008	430	-	-	-
		48"	0.088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	0.008	535	0.29	0.008	431	-	-	-	
		60"	0.090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.59	0.008	360	-	-	-	-	-	-	-	0.26	0.008	535	0.25	0.008	431	-	-	-	
		72"	0.089	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	535	0.30	0.008	430	-	-	-		
	Scandinavia	36"	0.087	0.40	0.009	41	0.35	0.008	37	0.35	0.008	38	0.40	0.008	47	0.35	0.008	40	0.40	0.008	22	-	-	-	0.40	0.008	18	0.40	0.008	27	0.35	0.008	42	0.34	0.008	46	0.34	0.008	38	
		48"	0.085	0.33	0.009	41	0.29	0.008	37	0.29	0.008	39	0.30	0.008	48	0.29	0.008	41	0.30	0.008	23	0.71	0.008	35	0.30	0.008	19	0.34	0.008	28	0.29	0.008	43	0.29	0.008	46	0.28	0.008	39	
		60"	0.087	0.29	0.009	42	0.26	0.008	38	0.26	0.008	39	0.27	0.008	48	0.26	0.008	41	0.27	0.008	23	0.59	0.008	37	0.27	0.008	19	0.29	0.008	29	0.26	0.008	43	0.25	0.008	47	0.25	0.008	39	
		72"	0.086	0.27	0.009	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	20	0.27	0.008	29	0.30	0.008	43	0.30	0.008	46	0.26	0.008	39	
	Southern Europe	36"	0.090	-	-	-	-	-	-	0.35	0.008	554	-	-	-	-	-	-	0.40	0.008	584	-	-	-	-	-	-	-	-	-	0.35	0.008	621	0.34	0.008	538	-	-	-	
		48"	0.088	-	-	-	-	-	-	0.29	0.008	555	-	-	-	-	-	-	0.30	0.008	585	0.71	0.008	423	-	-	-	-	-	-	0.29	0.008	622	0.29	0.008	538	-	-	-	
		60"	0.090	-	-	-	-	-	-	0.26	0.008	555	-	-	-	-	-	-	0.27	0.008	585	0.59	0.008	424	-	-	-	-	-	0.26	0.008	622	0.25	0.008	539	-	-	-		
		72"	0.089	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	622	0.30	0.008	538	-	-	-			
	United Kingdom	36"	0.085	-	-	-	-	-	-	0.35	0.008	283	-	-	-	-	-	-	0.40	0.008	291	-	-	-	-	-	-	-	-	-	0.35	0.008	365	0.34	0.008	299	0.34	0.008	226	
		48"	0.083	-	-	-	-	-	-	0.29	0.008	284	-	-	-	-	-	-	0.30	0.008	292	0.71	0.008	248	-	-	-	-	-	0.29	0.008	366	0.29	0.008	300	0.28	0.008	226		
		60"	0.085	-	-	-	-	-	-	0.26	0.008	284	-	-	-	-	-	-	0.27	0.008	293	0.59	0.008	249	-	-	-	-	-	0.26	0.008	366	0.25	0.008	300	0.25	0.008	227		
		72"	0.084	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	366	0.30	0.008	300	0.26	0.008	227			

**TABLE 5: EMBODIED CO2E & NET CO2E SAVINGS IN EUROPE (CONT.)**

15 Year Lifecycle (kg CO2e / Meter^2)			All Films		Silver AG 25 Low-e			Slate 10			Slate 20			Slate 30			Slate 40			Slate 50			Solar Bronze 20			Solar Bronze 35			Solar Bronze 50			
			Transportation to Customer	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved		
Europe	France	36"	0.088	0.36	0.008	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.008	47	0.34	0.008	48	-	-	-	
		48"	0.087	0.30	0.008	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.29	0.008	48	0.29	0.008	49	-	-	-	
		60"	0.089	0.26	0.008	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.26	0.008	48	0.25	0.008	49	-	-	-	
		72"	0.088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.008	48	0.30	0.008	49	-	-	-	
	Northern Europe	36"	0.090	0.36	0.008	519	0.41	0.009	521	-	-	-	-	-	-	0.39	0.009	329	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		48"	0.088	0.30	0.008	520	0.35	0.009	522	-	-	-	-	-	-	0.32	0.009	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		60"	0.090	0.26	0.008	520	0.30	0.009	522	-	-	-	-	-	-	0.28	0.009	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		72"	0.089	-	-	-	0.28	0.009	522	-	-	-	-	-	-	0.27	0.009	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scandinavia	36"	0.087	0.36	0.008	132	0.41	0.009	63	0.40	0.009	60	0.40	0.009	56	0.39	0.009	51	0.34	0.008	56	0.35	0.008	45	0.34	0.008	52	0.34	0.008	61	-	-
		48"	0.085	0.30	0.008	133	0.35	0.009	64	0.33	0.009	61	0.33	0.009	57	0.32	0.009	52	0.28	0.008	57	0.29	0.008	46	0.29	0.008	53	0.28	0.008	62	-	-
		60"	0.087	0.26	0.008	133	0.30	0.009	65	0.29	0.009	61	0.29	0.009	57	0.28	0.009	52	0.25	0.008	57	0.26	0.008	46	0.25	0.008	53	0.25	0.008	62	-	-
		72"	0.086	-	-	-	0.28	0.009	65	0.27	0.009	61	0.27	0.009	58	0.27	0.009	52	0.26	0.008	57	0.30	0.008	46	0.30	0.008	53	0.26	0.008	62	-	-
	Southern Europe	36"	0.090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		48"	0.088	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		60"	0.090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		72"	0.089	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	United Kingdom	36"	0.085	0.36	0.008	362	0.41	0.009	355	-	-	-	0.40	0.009	276	0.39	0.009	230	-	-	-	0.35	0.008	362	0.34	0.008	325	0.34	0.008	289	-	-
		48"	0.083	0.30	0.008	362	0.35	0.009	356	-	-	-	0.33	0.009	277	0.32	0.009	231	-	-	-	0.29	0.008	363	0.29	0.008	326	0.28	0.008	289	-	-
		60"	0.085	0.26	0.008	363	0.30	0.009	357	-	-	-	0.29	0.009	277	0.28	0.009	231	-	-	-	0.26	0.008	363	0.25	0.008	326	0.25	0.008	290	-	-
		72"	0.084	-	-	-	0.28	0.009	357	-	-	-	0.27	0.009	277	0.27	0.009	231	-	-	-	0.30	0.008	363	0.30	0.008	326	0.26	0.008	290	-	-

**TABLE 6: EMBODIED CO2E & NET CO2E SAVINGS IN EUROPE (CONT.)**

15 Year Lifecycle (kg CO2e / Meter^2)			All Films			Stainless Steel 10			Stainless Steel 20			Stainless Steel 30			Stainless Steel 35			Stainless Steel 50			Sterling 20			Sterling 40			Sterling 50			Sterling 60			Sterling 70		
						Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved
			Transportation to Customer																																
Europe	France	36"	0.088	0.40	0.008	40	0.35	0.008	37	0.34	0.008	32	0.34	0.008	26	0.34	0.008	22	0.35	0.008	-56	0.34	0.008	46	0.34	0.008	42	0.34	0.008	27	0.34	0.008	22		
		48"	0.087	0.30	0.008	41	0.29	0.008	38	0.29	0.008	33	0.29	0.008	27	0.28	0.008	23	0.29	0.008	-55	0.29	0.008	46	0.28	0.008	42	0.28	0.008	28	0.28	0.008	23		
		60"	0.089	0.27	0.008	42	0.30	0.008	38	0.25	0.008	33	0.25	0.008	27	0.25	0.008	23	0.26	0.008	-55	0.25	0.008	47	0.25	0.008	43	0.25	0.008	28	0.25	0.008	23		
	72"	0.088	0.25	0.008	42	0.30	0.008	38	0.30	0.008	33	0.30	0.008	26	0.26	0.008	23	0.30	0.008	-55	0.26	0.008	47	0.26	0.008	43	0.25	0.008	28	0.25	0.008	23			
	Northern Europe	36"	0.090	-	-	-	0.35	0.008	375	0.34	0.008	319	-	-	-	-	-	-	-	0.35	0.008	507	0.34	0.008	418	-	-	-	0.34	0.008	281	0.34	0.008	223	
		48"	0.088	-	-	-	0.29	0.008	376	0.29	0.008	319	-	-	-	-	-	-	-	0.29	0.008	508	0.29	0.008	419	-	-	-	0.28	0.008	282	0.28	0.008	224	
		60"	0.090	-	-	-	0.30	0.008	376	0.25	0.008	319	-	-	-	-	-	-	-	0.26	0.008	508	0.25	0.008	419	-	-	-	0.25	0.008	282	0.25	0.008	224	
	72"	0.089	-	-	-	0.30	0.008	376	0.30	0.008	317	-	-	-	-	-	-	-	0.30	0.008	508	0.26	0.008	419	-	-	-	0.25	0.008	282	0.25	0.008	224		
	Scandinavia	36"	0.087	0.40	0.008	67	0.35	0.008	55	0.34	0.008	47	0.34	0.008	44	0.34	0.008	36	0.35	0.008	78	0.34	0.008	72	0.34	0.008	66	0.34	0.008	47	0.34	0.008	42		
		48"	0.085	0.30	0.008	68	0.29	0.008	56	0.29	0.008	48	0.29	0.008	44	0.28	0.008	37	0.29	0.008	79	0.29	0.008	73	0.28	0.008	66	0.28	0.008	48	0.28	0.008	43		
		60"	0.087	0.27	0.008	68	0.30	0.008	56	0.25	0.008	48	0.25	0.008	45	0.25	0.008	37	0.26	0.008	79	0.25	0.008	73	0.25	0.008	67	0.25	0.008	48	0.25	0.008	43		
	72"	0.086	0.25	0.008	68	0.30	0.008	56	0.30	0.008	48	0.30	0.008	44	0.26	0.008	37	0.30	0.008	79	0.26	0.008	73	0.26	0.008	67	0.25	0.008	48	0.25	0.008	43			
	Southern Europe	36"	0.090	0.40	0.008	652	0.35	0.008	519	0.34	0.008	484	0.34	0.008	349	0.34	0.008	304	0.35	0.008	640	-	-	-	0.34	0.008	476	0.34	0.008	365	0.34	0.008	182		
		48"	0.088	0.30	0.008	653	0.29	0.008	519	0.29	0.008	485	0.29	0.008	350	0.28	0.008	305	0.29	0.008	640	-	-	-	0.28	0.008	477	0.28	0.008	366	0.28	0.008	183		
		60"	0.090	0.27	0.008	653	0.30	0.008	520	0.25	0.008	485	0.25	0.008	350	0.25	0.008	305	0.26	0.008	641	-	-	-	0.25	0.008	477	0.25	0.008	366	0.25	0.008	183		
	72"	0.089	0.25	0.008	653	0.30	0.008	519	0.30	0.008	484	0.30	0.008	350	0.26	0.008	305	0.30	0.008	641	-	-	-	0.26	0.008	477	0.25	0.008	366	0.25	0.008	183			
	United Kingdom	36"	0.085	0.40	0.008	319	0.35	0.008	263	0.34	0.008	224	0.34	0.008	193	0.34	0.008	176	0.35	0.008	348	0.34	0.008	290	0.34	0.008	257	0.34	0.008	198	0.34	0.008	158		
		48"	0.083	0.30	0.008	320	0.29	0.008	264	0.29	0.008	225	0.29	0.008	194	0.28	0.008	177	0.29	0.008	349	0.29	0.008	291	0.28	0.008	257	0.28	0.008	199	0.28	0.008	159		
		60"	0.085	0.27	0.008	320	0.30	0.008	264	0.25	0.008	225	0.25	0.008	194	0.25	0.008	177	0.26	0.008	349	0.25	0.008	292	0.25	0.008	258	0.25	0.008	199	0.25	0.008	159		
	72"	0.084	0.25	0.008	321	0.30	0.008	264	0.30	0.008	225	0.30	0.008	193	0.26	0.008	177	0.30	0.008	349	0.26	0.008	292	0.26	0.008	258	0.25	0.008	199	0.25	0.008	159			







**TABLE 10: EMBODIED CO2E & NET CO2E SAVINGS IN THE SOUTHERN HEMISPHERE**

15 Year Lifecycle (kg CO2e / Meter^2)		All Films	Autumn Bronze 30	Bronze Silver 15	Bronze Silver 20	Bronze Silver Bronze 10	Grey Silver 15	Grey Silver Grey 10	LX70	Quantum Silver Quantum 10	Quantum Silver Quantum 20	Silver 20	Silver 35	Silver 50	
		Transportation to Customer	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved	Manufacturing End-of-Life Net CO2e Saved
Southern Hemisphere	Southern Africa	36"	0.154	-	-	-	-	-	-	-	-	-	-	-	-
		48"	0.151	-	-	-	-	-	-	-	-	-	-	-	-
		60"	0.154	-	-	-	-	-	-	0.71	0.008	812	-	-	-
		72"	0.152	-	-	-	-	-	-	0.59	0.008	814	-	-	-
	Argentina	36"	0.092	-	-	-	0.35	0.008	343	0.40	0.008	361	-	-	-
		48"	0.091	-	-	-	0.29	0.008	344	0.30	0.008	362	-	-	-
		60"	0.093	-	-	-	0.26	0.008	344	0.27	0.008	362	-	-	-
		72"	0.091	-	-	-	-	-	-	-	-	-	-	-	-
	Australia	36"	0.121	-	-	-	-	-	-	-	-	-	0.35	0.008	678
		48"	0.118	-	-	-	-	-	-	-	-	-	0.29	0.008	679
		60"	0.121	-	-	-	-	-	-	-	-	-	0.26	0.008	679
		72"	0.119	-	-	-	-	-	-	-	-	-	0.30	0.008	679
	Brazil	36"	0.087	-	-	-	0.35	0.008	343	0.40	0.008	361	-	-	-
		48"	0.085	-	-	-	0.29	0.008	345	0.30	0.008	363	-	-	-
		60"	0.087	-	-	-	0.26	0.008	344	0.27	0.008	363	-	-	-
		72"	0.086	-	-	-	-	-	-	-	-	-	0.25	0.008	376



**TABLE 12: EMBODIED CO2E & NET CO2E SAVINGS IN THE SOUTHERN HEMISPHERE (CONT.)**

15 Year Lifecycle (kg CO2e / Meter^2)		All Films			Stainless Steel 10			Stainless Steel 20			Stainless Steel 30			Stainless Steel 35			Stainless Steel 50			Sterling 20			Sterling 40			Sterling 50			Sterling 60			Sterling 70		
		Transportation to Customer	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved	Manufacturing	End-of-Life	Net CO2e Saved		
Southern Hemisphere	Southern Africa	36"	0.154	-	-	-	0.35	0.008	1,009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		48"	0.151	-	-	-	0.29	0.008	1,010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		60"	0.154	-	-	-	0.30	0.008	1,010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		72"	0.152	-	-	-	0.30	0.008	1,010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Argentina	36"	0.092	0.40	0.008	387	0.35	0.008	323	0.34	0.008	262	-	-	-	-	-	-	-	-	-	-	-	-	0.34	0.008	278	-	-	-	0.34	0.008	138	
		48"	0.091	0.30	0.008	388	0.29	0.008	324	0.29	0.008	262	-	-	-	-	-	-	-	-	-	-	-	-	0.28	0.008	279	-	-	-	0.28	0.008	138	
		60"	0.093	0.27	0.008	388	0.30	0.008	324	0.25	0.008	263	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	279	-	-	-	0.25	0.008	139	
		72"	0.091	0.25	0.008	388	0.30	0.008	324	0.30	0.008	262	-	-	-	-	-	-	-	-	-	-	-	-	0.26	0.008	279	-	-	-	0.25	0.008	139	
	Australia	36"	0.121	-	-	-	0.35	0.008	556	-	-	-	0.34	0.008	384	0.34	0.008	339	0.35	0.008	735	0.34	0.008	585	0.34	0.008	479	0.34	0.008	339	0.34	0.008	244	
		48"	0.118	-	-	-	0.29	0.008	557	-	-	-	0.29	0.008	384	0.28	0.008	340	0.29	0.008	736	0.29	0.008	585	0.28	0.008	480	0.28	0.008	339	0.28	0.008	245	
		60"	0.121	-	-	-	0.30	0.008	557	-	-	-	0.25	0.008	385	0.25	0.008	340	0.26	0.008	736	0.25	0.008	586	0.25	0.008	480	0.25	0.008	340	0.25	0.008	245	
		72"	0.119	-	-	-	0.30	0.008	557	-	-	-	0.30	0.008	384	0.26	0.008	340	0.30	0.008	736	0.26	0.008	586	0.26	0.008	480	0.25	0.008	340	0.25	0.008	245	
	Brazil	36"	0.087	0.40	0.008	395	0.35	0.008	324	0.34	0.008	262	-	-	-	-	-	-	-	-	-	-	-	-	0.34	0.008	304	-	-	-	0.34	0.008	140	
		48"	0.085	0.30	0.008	396	0.29	0.008	324	0.29	0.008	263	-	-	-	-	-	-	-	-	-	-	-	-	0.28	0.008	304	-	-	-	0.28	0.008	141	
		60"	0.087	0.27	0.008	397	0.30	0.008	325	0.25	0.008	263	-	-	-	-	-	-	-	-	-	-	-	-	0.25	0.008	304	-	-	-	0.25	0.008	141	
		72"	0.086	0.25	0.008	397	0.30	0.008	324	0.30	0.008	262	-	-	-	-	-	-	-	-	-	-	-	-	0.26	0.008	304	-	-	-	0.25	0.008	141	