

LX Glas Corp., R&D Center  
 296, Oehang 1-gil, Gunsan-si, Jeollabuk-do, (54008), Korea TEL (063) 460-1333 FAX (063) 467-2985

Report No.	20240238	Date of Receipt	2024-03-20	Date of test	2024-03-26 ~ 2024-04-15
Client	SANGBO corp.			Name	Park, Ye Rim
Address	(10016) 50, Daeseomyeong-ro, Tong Jin-Eup, Gimpo, Gyeong Gi Do, Korea 10016			Uses	Quality Control
Test Sample	HX90 13		Test Item	Optical Properties	

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## Test Results

- Test method used : ISO 9050:2003, 3.2 Performance of optical measurements  
 KS L 2016:2014, 6.3 Performance of optical measurements; JIS A 5759:2016, 6. Measurement method  
 KS L 2514:2011, 4.Measurement of spectral transmission and reflection factor
- Instrument : 1) FT-IR, Spectrophotometer, Nicolet, 6700, U.S.A.  
 2) UV-VIS-NIR Spectrophotometer, Perkin-Elmer, Lambda 950 & 1050, U.S.A.
- Testing environment : Temperature : min 21 °C, max 25 °C, Humidity : min 60 % R.H., max 65 % R.H.
- Location of Test :  Permanent Testing Lab  On Site Testing  
 (Address : 296, Oehang 1-gil, Gunsan-si, Jeollabuk-do, Republic of Korea)

### 5. Test Results :



Test Item	Symbol	Unit	ISO 9050 :2003	KS L 2016 :2014	JIS A 5759 :2016	KS L 2514 :2011
Solar Energy Transmittance	TE	%	8.0	8.2	8.0	7.5
Visible Light Transmittance	TL	%	13.1	12.9	13.1	13.1
Ultra Violet Transmittance	TUV	%	0.1		0.1	0.1
Solar Energy Reflectance(Ext.)	RE(e)	%	20.1	20.4	20.1	20.3
Solar Energy Reflectance(Int.)	RE(i)	%	7.2	7.1	7.2	7.0
Visible Light Reflectance(Ext.)	RL(e)	%	21.5	21.5	21.5	21.5
Visible Light Reflectance(Int.)	RL(i)	%	9.3	9.2	9.3	9.3
Solar Energy Absorbance(Ext.)	AE(e)	%	72.0	71.4	72.0	72.2
Correct Emissivity(Ext.)	E(e)	-				0.84
Correct Emissivity(Int.)	E(i)	-				0.85
Shading Coefficient	SC	-		0.37	0.37	
U-Value (Winter)	U-Value	W/m <sup>2</sup> K		5.9	6.0	
Solar Heat Gain Coefficient	SHGC	-			0.33	0.32
Solar Factor	S Factor	%	26.7			

\* Measuring condition(TL% & RL%) : ISO 9050, JIS A 5759 & KS L 2514 : D65/2, KS L 2016 : A/2

\*\* Measuring condition(TE%, RE% & AE%) : AM=1.5(300 nm ~ 2 500 nm)

\*\*\* Measuring condition(TUV%) : AM=1.5(300 nm ~ 380 nm), Film side (attached 3 mm Clear Glass) : Inside

' Continued '

Affirmation	Measurements performed by Name : Kim, Shin Ae 	Approved by Title : Technical Manager Name : Lee, Soo Yeon 
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23 - 04 - 2024

LX Glas Corp., Director of R&D Center

Accredited by KOLAS, Republic of KOREA



- The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
- The above test report can not be used for any advertisement & lawsuit and for other purpose than submitted.
- The above test certificate is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

5. Test Results (Continued) :

Test Item	Symbol (Unit)	ISO 9050 :2003	KS L 2514 :2011
* Total Solar Energy Rejected	TSER (%)	73.3	67.6

\* Film side(attached 3 mm Clear Glass) : Inside

\* This laboratory is not accredited for the test results marked \*.

Test Item	Symbol (Unit)	Spectrum average	Factor Application			
			ISO 9050 :2003	KS L 2016 :2014	JIS A 5759 :2016	KS L 2514 :2011
** Transmittance (780 nm ~ 2500 nm)	TIR (%)	2.0	3.3	3.5	3.3	3.2

\*\* Film side(attached 3 mm Clear Glass) : Inside

\*\* This laboratory is not accredited for the test results marked \*\*.

6. Specification of Sample :

Sample Type	Film attached Glass	Adhesive Strength	Exist
Film Side (Outside -> Inside)	Side 2	Substrate	3 mm Clear Glass

7. Picture of Sample :



\* The result is regarding the sample which is the 3 mm clear glass attaching the film

' End '