

# CERTIFICATE OF ACCREDITATION

**LX Glas Corp., R&D Center**

Accreditation No. : KT120

Corporation Registration No. : 110111-7324116

Address of Laboratory : (Branch site)296, Oehang 1-gil, Gunsan-si, Jeollabuk-do, Republic of Korea

Date of Initial Accreditation : November 21, 2000

Validity of Accreditation : April 07, 2022 ~ April 06, 2026

Scope of Accreditation : Attached Annex

Date of issue : May 23, 2024

This testing laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to Joint ISO-ILAC-IAF Communiqué).



*CHIN CHONGWOOK*

**Head**

**Korea Laboratory Accreditation Scheme**

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## 01. Mechanical Testing

### 01.007 Glass and glass Products

Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
ASTM C336-71(2020)	Glass and Related Products	Standard Test Method for Annealing Point and Strain Point of Glass by Fiber Elongation	(400 ~ 700) °C	BS	N
ASTM C338-93(2019)	Glass and Related Products	Standard Test Method for Softening Point of Glass	(400 ~ 900) °C	BS	N
ASTM C598-93(2019)	Glass and Related Products	Standard Test Method for Annealing Point and Strain Point of Glass by Beam Bending	(400 ~ 700) °C	BS	N
ASTM C693-93(2019)	Glass and Related Products	Standard Test Method for Density of Glass by Buoyancy	(1.500 0 ~ 3.000 0) g/cm <sup>3</sup>	BS	N
ASTM C965-23	Glass and Related Products	Standard Practice for Measuring Viscosity of Glass Above the Softening Point	(800 ~ 1 500) °C	BS	N
ASTM E228-22	Glass and Related Products	Standard Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer	(20 ~ 1 000) °C	BS	N
BS EN 1096-2:2012	Glass and Related Products	Glass in building - Coated glass - Part 2: Requirements and test methods for class A, B and S coatings	Transmittance (550 , 900) nm	BS	N
BS EN 1096-3:2012	Glass and Related Products	Glass in building - Coated glass - Part 3: Requirements and test methods for class C and D coatings	Transmittance (550 , 900) nm	BS	N
DIN EN 1279-2:2018	Glass and Related Products	Glass in building - Insulating glass units - Part 2: Long term test method and requirements for moisture penetration	Dew point : (-50 ~ 20) °C	BS	N
DIN EN 673:2011	Glass and Related Products	Glass in building - Determination of thermal transmittance (U value) - Calculation method	(10 ~ 30) °C	BS	N

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Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
ISO 10292:1994	Glass and Related Products	Glass in building -- Calculation of steady- state U values (thermal transmittance) of multiple glazing	(10 ~ 30) °C	BS	N
ISO 17562:2016	Glass and Related Products	Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for linear thermal expansion of monolithic ceramics by push-rod technique	(20 ~ 1 000) °C	BS	N
ISO 7884-2:1987	Glass and Related Products	Glass -- Viscosity and viscometric fixed points -- Part 2: Determination of viscosity by rotation viscometers	(800 ~ 1 500) °C	BS	N
ISO 7884-3:1987	Glass and Related Products	Glass -- Viscosity and viscometric fixed points -- Part 3: Determination of viscosity by fibre elongation viscometer	(400 ~ 900) °C	BS	N
ISO 7884-4:1987	Glass and Related Products	Glass -- Viscosity and viscometric fixed points -- Part 4: Determination of viscosity by beam bending	(400 ~ 700) °C	BS	N
ISO 7884-6:1987	Glass and Related Products	Glass -- Viscosity and viscometric fixed points -- Part 6: Determination of softening point	(400 ~ 900) °C	BS	N
ISO 7884-7:1987	Glass and Related Products	Glass -- Viscosity and viscometric fixed points -- Part 7: Determination of annealing point and strain point by beam bending	(400 ~ 700) °C	BS	N
ISO 7884-8:1987	Glass and Related Products	Glass -- Viscosity and viscometric fixed points -- Part 8: Determination of (dilatometric) transformation temperature	(20 ~ 1 000) °C	BS	N
ISO 7991:1987	Glass and Related Products	Glass -- Determination of coefficient of mean linear thermal expansion	(20 ~ 1 000) °C	BS	N

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Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
ISO 8990:1994	Glass and Related Products	Thermal insulation -- Determination of steady-state thermal transmission properties - - Calibrated and guarded hot box	(10 ~ 30) °C	BS	N
JIS R 3103-1:2001	Glass and Related Products	Viscosity and viscometric fixed points of glass -- Part 1: Determination of softening point	(400 ~ 900) °C	BS	N
JIS R 3107:2019	Glass and Related Products	Calculation of thermal transmittance of glazing	(10 ~ 30) °C	BS	N
JIS R 3209:2023	Glass and Related Products	Insulating glass	Dew point : (-50 ~ 20) °C	BS	N
JIS R 3220:2011	Glass and Related Products	Glass in building -- Silvered, flat-glass mirror	Reflectance : (380 ~ 780) nm	BS	N
KS F 2273:2020	Glass and Related Products	Methods of performance test for building construction panels 7.5 U-value	(10 ~ 30) °C	BS	N
KS F 2277:2017	Glass and Related Products	Thermal insulation - Determinati on of steady - state thermal transmission properties - Calibrated and guarded hot box	(10 ~ 30) °C	BS	N
KS L 2002:2006	Glass and Related Products	Tempered glass	Length : (0.1 ~ 3 000) mm, Thickness : (0.01 ~ 30) mm, Curve : (0.01 ~ 0.5) %	BS	N
KS L 2003:2013	Glass and Related Products	Sealed insulating glass	Dew point : (-50 ~ 20) °C, Emissivity difference of Optical Thin Performance (0.001 ~ 0.80)	BS	N
KS L 2004:2014	Glass and Related Products	Laminated glass	Length : (0.1 ~ 5 000) mm, Thickness : (0.01 ~ 25) mm, Light Resistance : (0.1 ~ 100) %, Curve : (0.01 ~ 0.5) %	BS	N
KS L 2008:2003	Glass and Related Products	Heat absorbing glass	Length : (0.1 ~ 5 000) mm, Thickness : (0.01 ~ 25) mm, SHGC : (300 ~ 2 500) nm	BS	N

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Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
KS L 2014:2010	Glass and Related Products	Solar reflective glass	Length : (0.1 ~ 5 000) mm, Thickness : (0.01 ~ 25) mm, SHGC : (300 ~ 2 500) nm, Change ratio of TL% for Light Resistance, Abrasion Resistance, Acid Resistance, Alkali Resistance : (0 ~ 4) %	BS	N
KS L 2015:2006	Glass and Related Products	Heat-strengthened glass	Length : (0.1 ~ 5 000) mm, Thickness : (0.01 ~ 25) mm, Curve : (0.01 ~ 0.5) %, Surface Compressive Stress : (15.0 ~ 90.0) MN/m <sup>2</sup>	BS	N
KS L 2017:2008	Glass and Related Products	Low emissivity glass	Length : (0.1 ~ 5 000) mm, Thickness : (0.01 ~ 25) mm, Emissivity : 0.01 ~ 1, Wet endurance : (50 ± 3) °C, (90 ± 3) % R.H	BS	N
KS L 2104:2009	Glass and Related Products	Glass for mirror	Length : (0.1 ~ 5 000) mm, Reflectance : (0 ~ 100) %	BS	N
KS L 2401:2009	Glass and Related Products	Testing method for annealing point and strain point of glass by beam bending	(400 ~ 700) °C	BS	N
KS L 2406:2018	Glass and Related Products	Mirror	Length : (0.1 ~ 5 000) mm, Reflectance : (0 ~ 100) %	BS	N
KS L 2506:2009	Glass and Related Products	Testing method for average linear thermal expansion of glass	(20 ~ 1 000) °C	BS	N
KS L 2525:2006	Glass and Related Products	Evaluation on thermal resistance of flat glasses and thermal transmittance of glazing	(10 ~ 30) °C	BS	N
KS L ISO 17562:2016	Glass and Related Products	Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for linear thermal expansion of monolithic ceramics by push-rod technique	(20 ~ 1 000) °C	BS	N

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KS L ISO 7884-2:1987	Glass and Related Products	Glass - Viscosity and viscometric fixed points - Part 2 : Determination of viscosity by rotation viscometers	(800 ~ 1 500) °C	BS	N
KS L ISO 7884-3:1987	Glass and Related Products	Glass - Viscosity and viscometric fixed points - Part 3 : Determination of viscosity by fibre elongation viscometer	(400 ~ 900) °C	BS	N
KS L ISO 7884-4:1987	Glass and Related Products	Glass - Viscosity and viscometric fixed points - Part 4 : Determination of viscosity by beam bending	(400 ~ 700) °C	BS	N
KS L ISO 7884-6:2014	Glass and Related Products	Glass - Viscosity and viscometric fixed points - Part 6: Determination of softening point	(400 ~ 900) °C	BS	N
KS L ISO 7884-7:2014	Glass and Related Products	Glass - Viscosity and viscometric fixed points - Part 7: Determination of annealing point and strain point by beam bending	(400 ~ 700) °C	BS	N
KS L ISO 7884-8:1987	Glass and Related Products	Glass - Viscosity and viscometric fixed points - Part 8 : Determination of dilatometric transformation temperature	(20 ~ 1 000) °C	BS	N

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## 01. Mechanical Testing

### 01.016 Construction and construction materials

Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
KS F 2292:2019	Construction and construction materials	The method of air tightness for windows and doors	- Pressure : (10, 30, 50, 100, 250) Pa	BS	N
KS F 2293:2008	Construction and construction materials	Test method of water tightness for windows and doors	- Water Spray : 4 L/(min · m <sup>2</sup> ) - Pulsatile Pressure : (50 / 150, 75 / 225, 125 / 375, 175 / 525, 250 / 750) Pa	BS	N
KS F 2296:2019	Construction and construction materials	Windows and doorsets - Wind resistance test	- Pressure : ± 5 000 Pa - Transversion : (0 ~ 100) mm	BS	N
KS F 3117:2019	Construction and construction materials	Window sets 9.4 Wind Resistance Test 9.5 Air Tightness Test 9.6 Water Tightness Test	Wind Resistance :- Pressure : ± 5 000 Pa - Transversion : (0 ~ 100) mm Air Tightnes : - Pressure : (10, 30, 50, 100, 250) Pa Water Tightnes : - Water Spray : 4 L/(min · m <sup>2</sup> ), - Pulsatile Pressure : (50 ~ 750) Pa	BS	N
MOLIT Notice No. 2021-330 (04.20.2021)	Construction and construction materials	High Efficiency Appliance Certification Program 3. Metal material curtain wall	(10, 30, 50, 100, 250) Pa	BS	N
MOTIE Notice No. 2021-67 (04.20.2021)	Construction and construction materials	High Efficiency Appliance Certification Program 3. Metal material curtain wall	(10, 30, 50, 100, 250) Pa	BS	N

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Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
MOTIE Notice No. 2024-1 (01.02.2024)	Construction and construction materials	Energy efficiency management equipment operation regulations Chapter 2. Efficiency control equipment of range and measurement method Article 4. (Appoint of efficiency management equipment of range and measurement method etc) 25. Window sets	(10, 30, 50, 100, 250) Pa	BS	N



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## 04. Heat and Temperature Measurement

### 04.001 Temperature and Humidity

Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
KS F 2278:2017	Construction and construction materials	Standard test method for thermal resistance for windows and doors	-U-value : (0.100 ~ 5.000) W/(m <sup>2</sup> · K)	BS	N
KS F 2295:2004	Construction and construction materials	Test method of dew condensation for windows and doors	-Px : (0.00 ~ 1.00)	BS	N
KS F 3117:2019	Construction and construction materials	Window sets 9.8 Thermal Transmittance Resistance Test	- U-value : (0.100 ~ 5.000) W/(m <sup>2</sup> · K)	BS	N
MOLIT Notice No.2016- 835(12.07.2016.)	Construction and construction materials	Design criteria of dew condensation for multifamily housing Article 5. (Performance Evaluation) [Attached table 2] Dew condensation prevention performance evaluation method by main point 3. Window	-TDR : (0.00 ~ 1.00)	BS	N
MOLIT Notice No. 2021-330 (04.20.2021)	Construction and construction materials	High Efficiency Appliance Certification Program 3. Metal material curtain wall(U-value)	- U-value : (0.100 ~ 5.000) W/(m <sup>2</sup> · K)	BS	N
MOTIE Notice No. 2021-67 (04.20.2021)	Construction and construction materials	High Efficiency Appliance Certification Program 3. Metal material curtain wall(U-value)	- U-value : (0.100 ~ 5.000) W/(m <sup>2</sup> · K)	BS	N
MOTIE Notice No. 2024-1 (01.02.2024)	Construction and construction materials	Energy efficiency management equipment operation regulations Chapter 2. Efficiency control equipment of range and measurement method Article 4. (Appoint of efficiency management equipment of range and measurement method etc) 25. Window sets(U- value)	- U-value : (0.100 ~ 5.000) W/(m <sup>2</sup> · K)	BS	N

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## 07. Optics and Photometry Testing

### 07.003 Spectrum Characteristic

Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
ASTM D1003-21	Plastics and Related Products	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics	Haze : $\geq 30 \%$	BS	N
ASTM E1331-15(2023)	Glass and Related Products, Plastics and Related Products	Standard Test Method for Reflectance Factor and Color by Spectrophotometry Using Hemispherical Geometry	(380 ~ 780) nm	BS	N
ASTM E1348-22	Glass and Related Products, Plastics and Related Products	Standard Test Method for Transmittance and Color by Spectrophotometry Using Hemispherical Geometry	(380 ~ 780) nm	BS	N
ASTM E313-20	Plastics and Related Products	Standard Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates	(380 ~ 780) nm	BS	N
ASTM E424-71(2023)	Glass and Related Products	Standard Test Methods for Solar Energy Transmittance and Reflectance (Terrestrial) of Sheet Materials 6. Method A- Spectrophotometric Method	(300 ~ 2 500) nm	BS	N
BS EN 12898:2019	Glass and Related Products	Glass in building -- Determination of the emissivity	(5 ~ 50) $\mu\text{m}$	BS	N
DIN EN 410:2011-04	Glass and Related Products	Glass in building -- Determination of luminous and solar characteristics of glazing English translation of DIN EN 410:2011-04	(300 ~ 2 500) nm	BS	N
ISO 13837:2021	Glass and Related Products	Road vehicles. Safety glazing materials Method for the determination of solar transmittance	(300 ~ 2 500) nm	BS	N
ISO 14782:2021	Plastics and Related Products	Plastics Determination of haze for transparent materials	Haze : $\leq 40 \%$	BS	N

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Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
ISO 9050:2003	Glass and Related Products	Glass in building -- Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors	(300 ~ 2 500) nm	BS	N
JIS A 5759:2016	Glass and Related Products	Adhesive films for glazings 6.4. Visible light transmittance test 6.5 Calculation of shading coefficient and solar heat gain coefficient 6.6 Calculation of thermal transmittance 6.7 Ultraviolet transmittance test	Vis Tr. : (380 ~ 780) nm, SF : (300 ~ 2500) nm, Emissivity : (5.5 ~ 50) $\mu\text{m}$ , UV Tr. : (300 ~ 380) nm	BS	N
JIS K 7136:2000	Plastics and Related Products	Plastics -- Determination of haze for transparent materials	Haze : $\leq$ 40 %	BS	N
JIS R 3106:2019	Glass and Related Products	Testing method for transmittance, reflectance and emissivity of flat glass and calculation of total solar energy transmittance of glazing	Vis Tr. : (380 ~ 780) nm, Solar Tr. : (300 ~ 2 500) nm, Emissivity : (5.5 ~ 50) $\mu\text{m}$	BS	N
JIS Z 8715:1999	Glass and Related Products, Plastics and Related Products	Colour specification Whiteness of near white opaque materials	(380 ~ 780) nm	BS	N
JIS Z 8722:2009	Glass and Related Products, Plastics and Related Products	Methods of colour measurement -- Reflecting and transmitting objects	(380 ~ 780) nm	BS	N
JIS Z 8781-4:2013	Glass and Related Products, Plastics and Related Products	Colorimetry -- Part 4: CIE 1976 L*a*b* Colour space	(380 ~ 780) nm	BS	N

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Test method	Materials/ Products	Standard designation	Test range	Site	Field testing
KS A 0061:2015	Glass and Related Products, Plastics and Related Products	Specification of colours according to the CIE 1931 standard colorimetric system and the CIE 1964 supplementary standard colorimetric system 5.2 Three stimulate value for colour of materials 8.2 Measurement of colour of materials	(380 ~ 780) nm	BS	N
KS A 0063:2015	Glass and Related Products, Plastics and Related Products	Method for specification of colour differences for opaque materials 6.1 Measurement of colour by spectrum	(380 ~ 780) nm	BS	N
KS A 0066:2015	Glass and Related Products, Plastics and Related Products	Method of measurement for colour of reflecting or transmitting objects 5. Measurement of colour by spectrum	(380 ~ 780) nm	BS	N
KS A 0067:2015	Glass and Related Products, Plastics and Related Products	Colour specification - CIE L*a*b* and CIE L*u*v* colour spaces	(380 ~ 780) nm	BS	N
KS L 2016:2014	Glass and Related Products	Adhesive films for glazings 6.3 Optical properties	Tvis : (380 ~ 780) nm, Te : (350 ~ 2 100) nm, Emissivity : (2 000 ~ 200) cm <sup>-1</sup>	BS	N
KS L 2514:2011	Glass and Related Products	Testing method on transmittance and emittance of heat glasses and evaluation of solar heat gain coefficient [Exception: 12. color rendering]	(2 000 ~ 200) cm <sup>-1</sup> , (300 ~ 2 500) nm	BS	N
KS M ISO 14782:2008	Plastics and Related Products	Plastics - Determination of haze for transparent materials	Haze : ≤ 40 %	BS	N
NFRC 300-2023	Glass and Related Products	Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems	(300 ~ 2 500) nm	BS	N

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MOLIT Notice No. 2021-330 (04.20.2021)	Glass and Related Products, Plastics and Related Products	High Efficiency Appliance Certification Program 3. Metal material curtain wall	(300 ~ 2 500) nm, (2 000 ~ 200) cm <sup>-1</sup>	BS	N
MOTIE Notice No. 2021-67 (04.20.2021)	Glass and Related Products, Plastics and Related Products	High Efficiency Appliance Certification Program 3. Metal material curtain wall	(300 ~ 2 500) nm, (2 000 ~ 200) cm <sup>-1</sup>	BS	N

End.