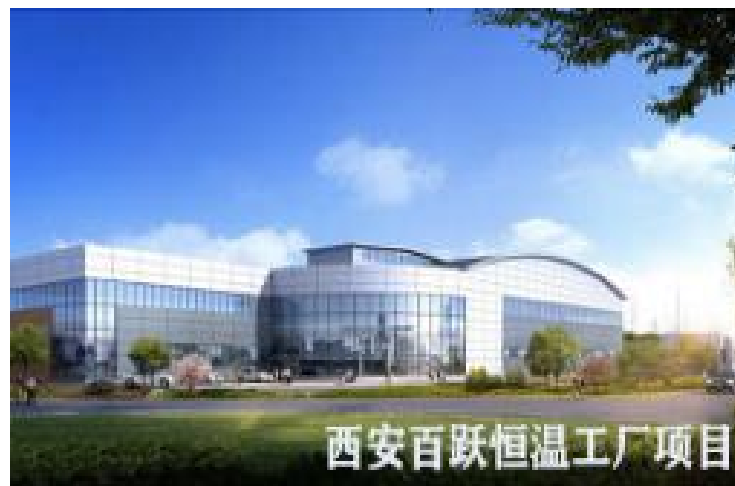
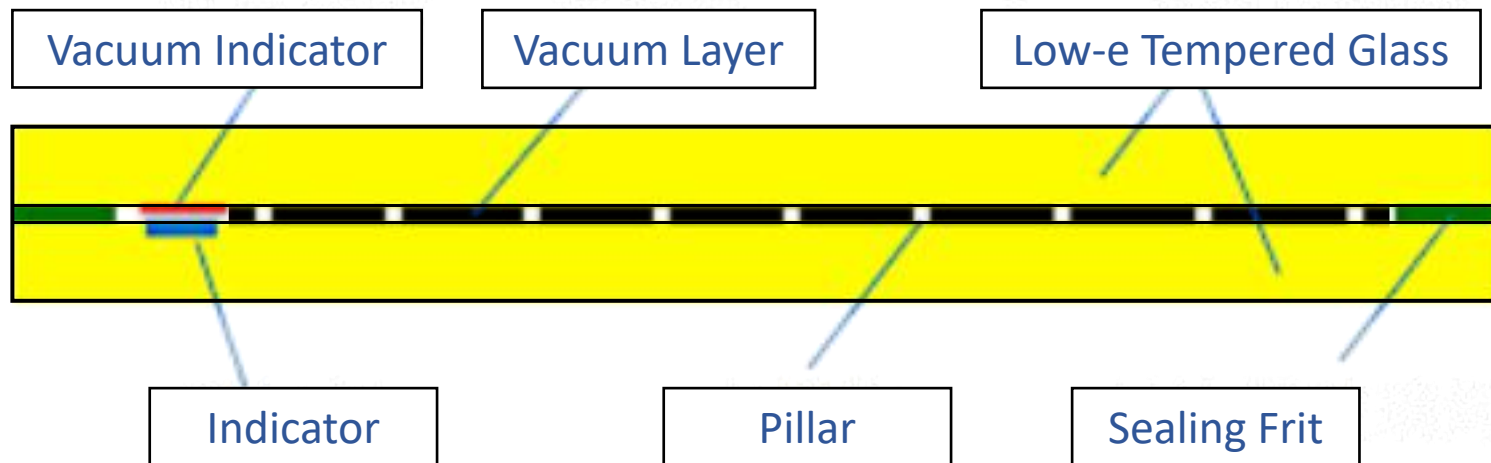
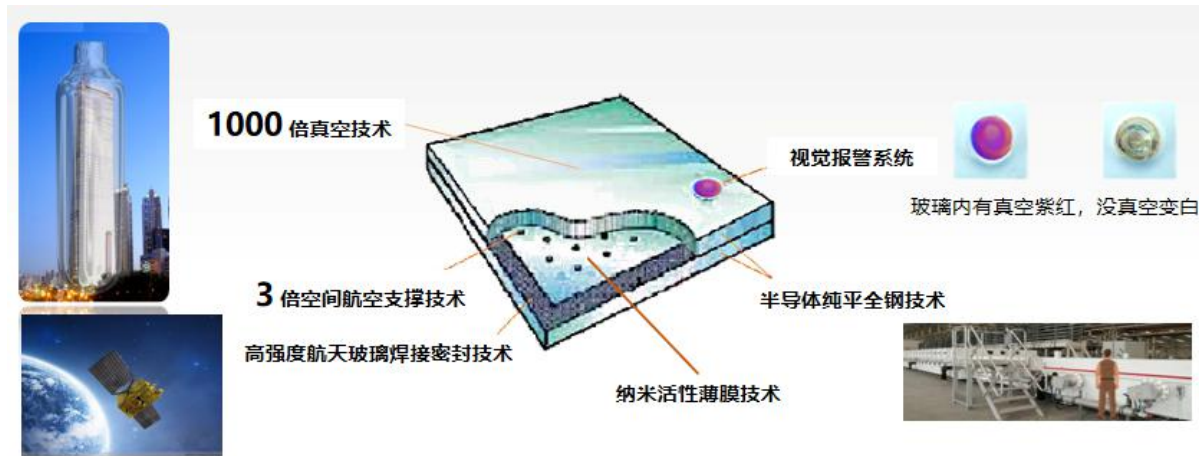


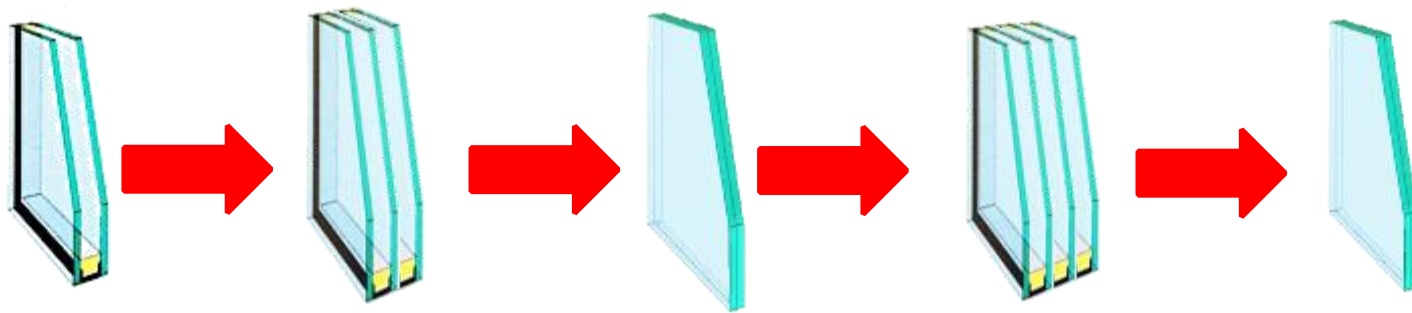
# Tempered Vacuum Insulated Glass



# Basic Structure of Tempered Vacuum Insulated Glass (TVIG)



# INCREDIBLE U-VALUES COMPARED TO TRADITIONAL IGU



LOW-E IG

$U=1.6 \text{ W/m}^2\cdot\text{K}$

20 Kg

Triple IG

$U=0.8 \text{ W/m}^2\cdot\text{K}$

30 Kg

Annealed VIG

$U=0.7 \text{ W/m}^2\cdot\text{K}$

20 Kg

Quadruple IG

$U=0.6 \text{ W/m}^2\cdot\text{K}$

40 Kg

Tempered VIG

$U=0.4 \text{ W/m}^2\cdot\text{K}$

20 Kg

# Extreme Insulation

We put a heat pad below the vacuum glass for 13 HOURS



## Test Environment

Ambient air temperature: 11.3°

Humidity: 65%

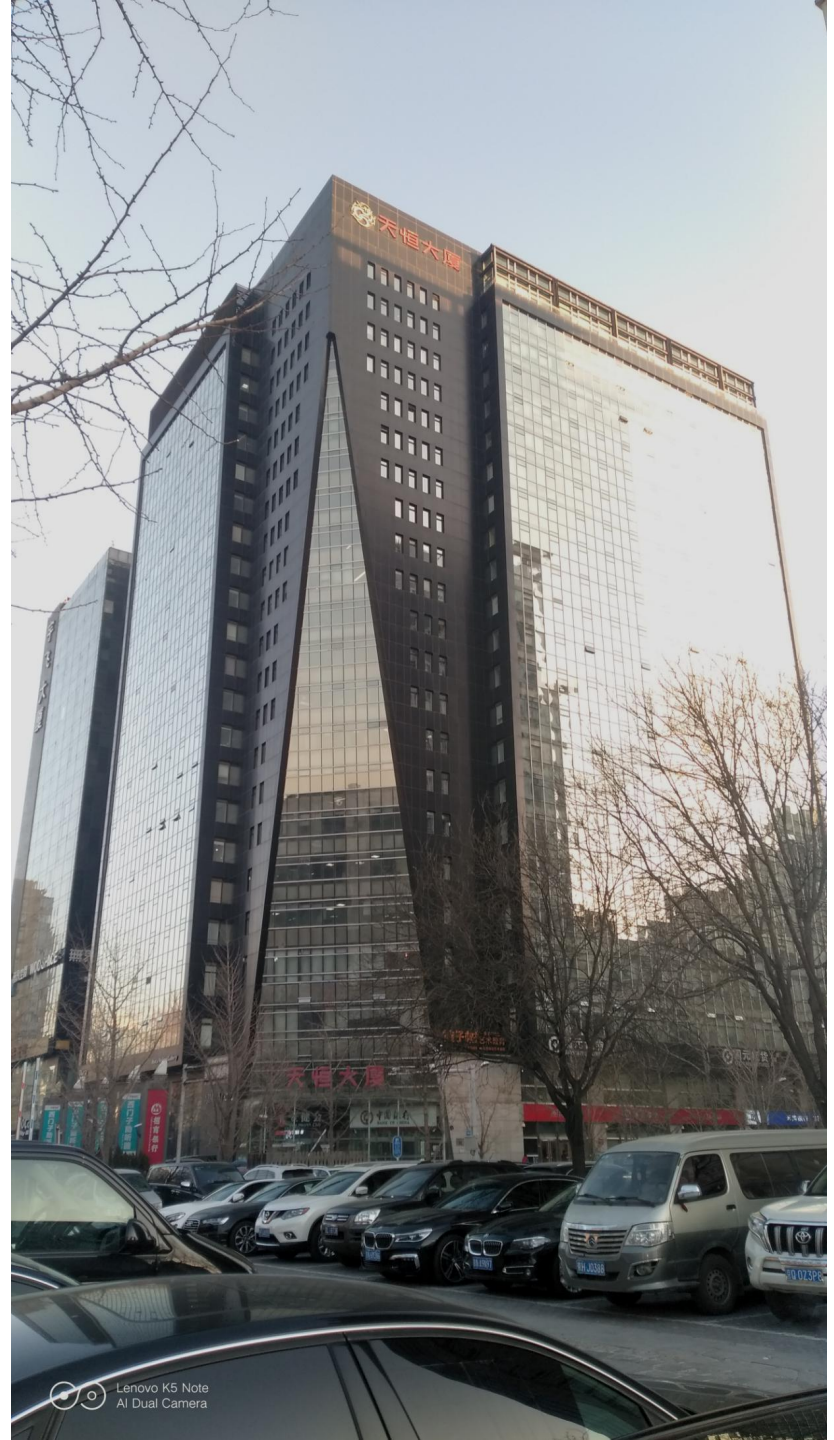
## After 13 hours of heating

Side of glass with heat pad: 126.3 °

Other side of glass: 18.9 °



SAVE  
**\$1.34/ft**  
PER YEAR  
(Beijing)



SAVE

**\$15.68/ft**

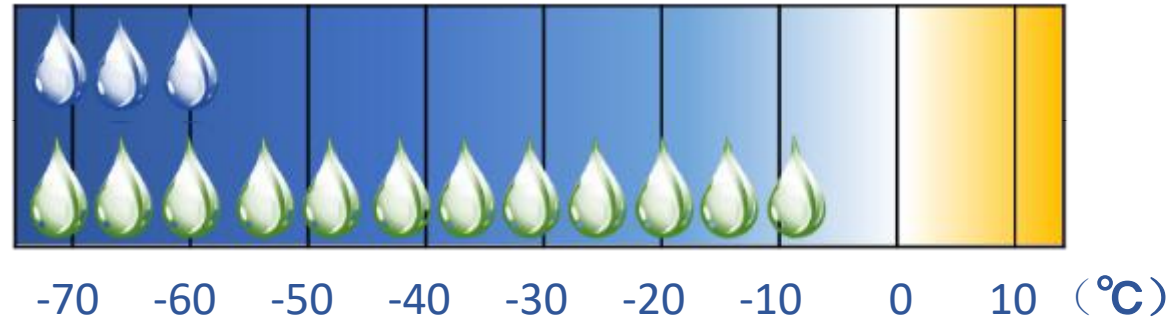
PER YEAR

(Poland)



# REDUCED CONDENSATION

TVIG  
IGU



TEST RESULT

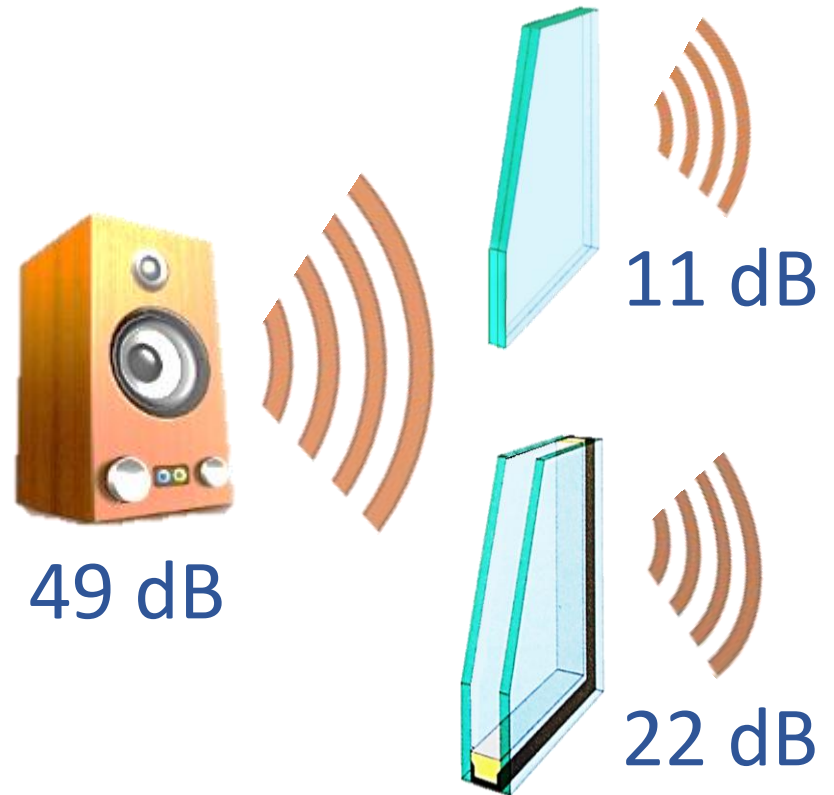
Unit	Sealant Width (Primary + Secondary) (min.-max., mm)	Initial Frost Point (°C)	Frost Point After 2 Weeks III(°C)	Frost Point After 9 Weeks AW(°C)	Frost Point After 4 Weeks III(°C)	Status After Fog
1	14-16	<-51	<-51	<-51	<-51	/
2	14-16	<-51	<-51	<-51	<-51	/
3	14-15	<-51	<-51	<-51	<-51	/
4	14-16	<-51	<-51	<-51	<-51	/
5	14-16	<-51	<-51	<-51	<-51	/
6	14-15	<-51	<-51	<-51	<-51	/
7	14-16	<-51	/	/	/	/
8	14-15	<-51	/	/	/	/
9	14-16	<-51	/	/	/	/
10	14-16	<-51	/	/	/	/
11	14-16	<-51	/	/	/	No Fog
12	14-16	<-51	/	/	/	No Fog
Requirements	N/A	N/A	≤-40	≤-40	≤-40	No Fog
Date	Mar.25,2017	Mar.25,2017	June 1,2017	Aug.4,2017	Sep.2,2017	May 12,2017
Conclusion	Meet the requirements of ASTM E2190					



# IMPROVED ACOUSTIC PERFORMANCE

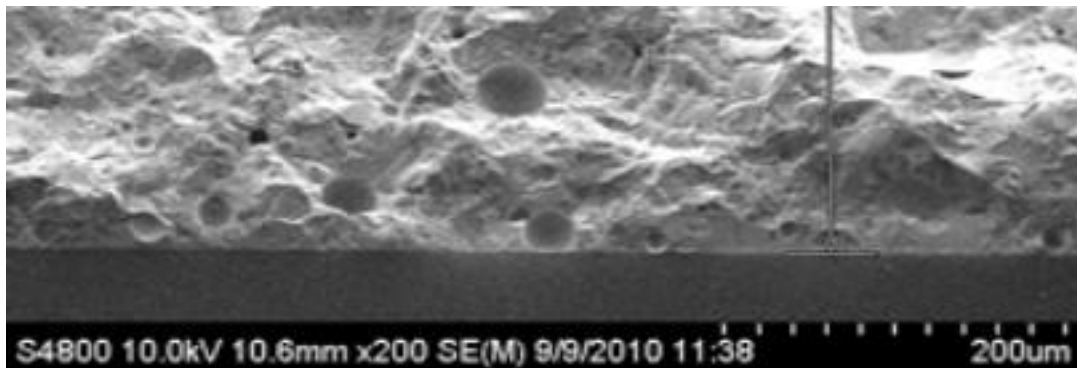
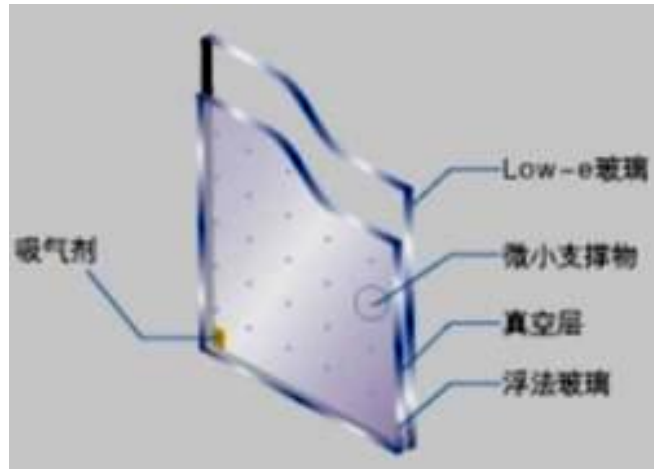


IGU: STC 27  
TVIG: STC 38



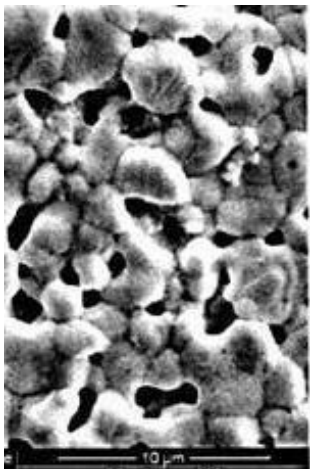


# LONGER LIFE

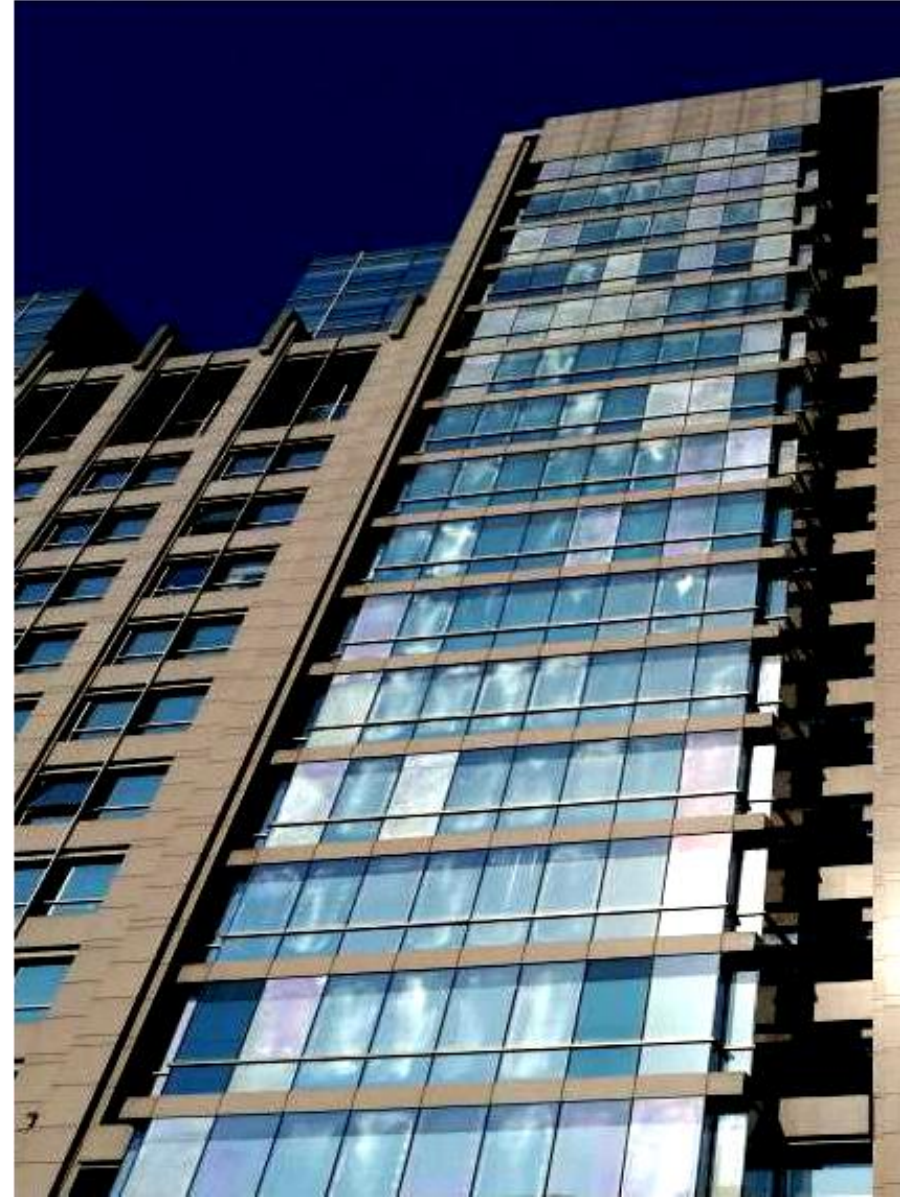


CERAMIC FRIT EDGE SEALING PRODUCES A WELD-LIKE SEAL THAT IS MORE CONSISTENT & STRONGER THAN METAL. THERE IS A LOWER CHANCE OF OXIDATION OF SOFT-COAT LOW-E.

# SHORTER LIFE

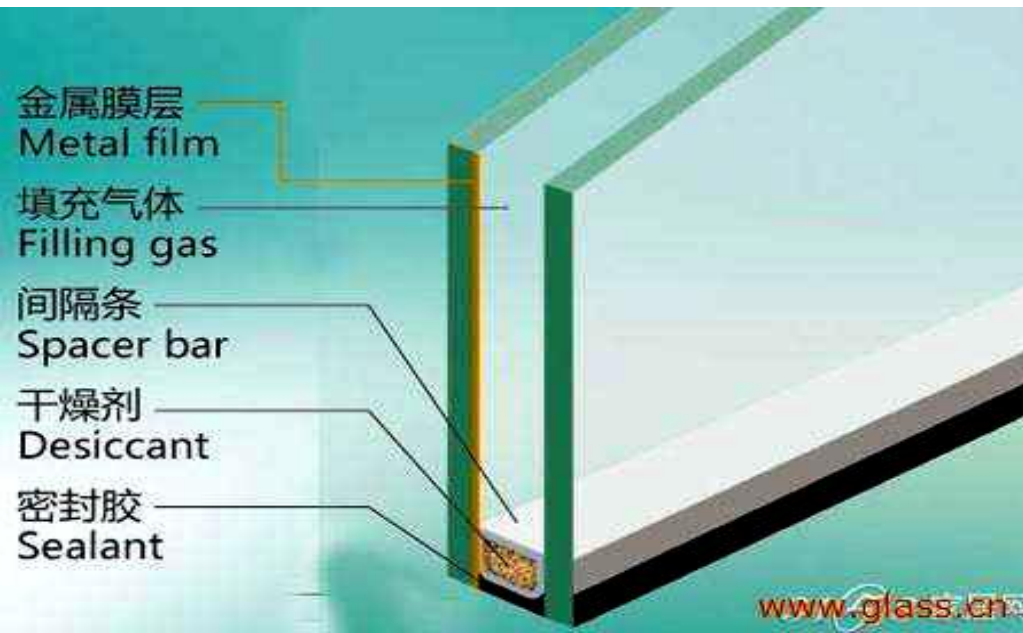


METAL SEALING CAN  
HAVE STOMATA  
(MICROSCOPIC PORES),  
THAT CAN LEAD TO  
FAILURE.



# SHORTER LIFE

Silicone leaks easily, which can cause water and gas to enter the hollow layer, resulting in the oxidation failure of the low-e film.





# 30 °C sun protection





# 30 °C sun protection



中国移动 下午2:54

← 龙旺真空玻璃(4) 龙旺真空玻璃(4)

59°C

29°C

左总家南阳台阳光房顶面玻璃实时温度59度，北阳光房顶面玻璃45度

热啊

明天开始安装龙旺真空玻璃，期待李博士@李宏彦 龙旺钢化真空玻璃的杰出表现 😄 😄

期待期待

下午2:47

南阳光房顶面

侧面

看来侧面是否也要换了？

语音输入 表情 更多 语音输入 表情 更多

# Visible Indicator for Status of Vacuum



# TEST RESULT OF PVC WINDOW



## PASSIVHAUS

MEET THE PASSIVHAUS  
NORTHERN CRITERIA  
WITHOUT THE NEED  
FOR TRIPLE GLAZING.

### 国家建筑工程质量监督检验中心检验报告

TEST REPORT OF NATIONAL CENTER FOR QUALITY  
SUPERVISION AND TEST OF BUILDING ENGINEERING

报告编号(No. of Report): BETA-QC1-2018-01308

第 2 页 共 8 页 (Page 2 of 8)

缝 长:	开启部分: 3.88 m	固定部分: ——		
面 积:	整窗面积: 2.19 m <sup>2</sup>	固定部分: ——		
玻 璃 品 种:	(TBLow-E+0.4V+T8) mm 龙旺钢化真空玻璃	镶嵌方式: 干法		
玻璃镶嵌材料:	胶条	框扇密封材料: 橡胶密封条		
气 温:	28.9℃	气 压: 100.1kPa		
最大玻璃尺寸:	宽: 720mm 长: 1340 mm 厚: (TBLow-E+0.4V+T8) mm			
保温检测条件	热箱空气温度: 20.0℃; 冷箱空气温度: -20.0℃; 热箱空气相对湿度: 30%; 热箱气流: 自然对流; 冷箱试件表面附近气流速度: 3.0m/s; 窗框面积与窗面积之比: 30.8%			
隔声检测条件	声源室容积: 239m <sup>3</sup> ; 接收室容积: 95m <sup>3</sup> ; 样品面积: 2.19m <sup>2</sup> ; 可开启面积: 0.78m <sup>2</sup> ; 面密度: 39.2kg/m <sup>2</sup> ; 相对湿度: 55.0%RH; 密封材料: 框扇使用胶条密封, 试件四周与试验洞口之间缝隙用水泥砂浆封堵			
序号	项目名称	检测结果		
1	气密性能 (10Pa 压力 差时)	单位缝长每小时渗透量 q <sub>1</sub>	正压	0.32 m <sup>3</sup> /(m·h)
			负压	0.38 m <sup>3</sup> /(m·h)
		单位面积每小时渗透量 q <sub>2</sub>	正压	0.57 m <sup>3</sup> /(m <sup>2</sup> ·h)
			负压	0.67 m <sup>3</sup> /(m <sup>2</sup> ·h)
2	水密性能	未发生严重渗漏压力	500 Pa	
3	抗风压性能	变形检测	正压	1.6 kPa
			负压	-1.6 kPa
		反复加压检测	正压	2.4 kPa
			负压	-2.4 kPa
		定级检测	正压	4.0 kPa
			负压	-4.0 kPa
4	保温性能	传热系数 K 值	0.73 W/(m <sup>2</sup> ·K)	
5	隔声性能	计权隔声量和频谱修正量为	R <sub>w</sub> (C <sub>1</sub> ; C <sub>2</sub> ) = 37 (-1; -3) dB	
<b>备注:</b> 保温性能检测试件为动风压三性能检测试件其中 1 樘。				

# TEST RESULT OF BROKEN BRIDGE ALUMINUM WINDOW



MEET THE 75%  
ENERGY SAVING  
CRITERIA WITHOUT  
THE NEED FOR  
TRIPLE GLAZING

## 国家建筑工程质量监督检验中心检验报告

TEST REPORT OF NATIONAL CENTER FOR QUALITY SUPERVISION AND TEST OF BUILDING ENGINEERING

报告编号(No. of Report): BETC-QC1-2018-01319

第1页 共4页 (Page 1 of 4)

委托单位 (Client)		天鹅铝业有限公司		
地址 (Add)		河南省沁阳市沁南工业园区	样品编号 (NO.)	QC1-2018-01319
样品 (Sample)	名称 (Name)	60系列内平开隔热铝合金窗 (内开·真空)	状态 (State)	完好
	商标 (Brand)	天姿白鹅	规格型号 (Type/Model)	(1480×1480×60)mm
生产单位 (Manufacturer)		天鹅铝业有限公司; 河南龙旺钢化真空玻璃有限公司		
送样/抽样日期 (Date of delivery/Sampling)		2018/08/27	数量 (Quantity)	1 樘
工程名称 (Name of engineering)		----		
取样部位 (Sampling position)		----		
检验 (Test)	项目 (Item)	保温性能	地点 (Place)	高碑店幕墙门窗试验室
	仪器 (Instruments)	COOK 保温检测设备 (QC-098)	日期 (Date)	2018/08/30
	检验依据 (Test based on)	GB/T8484-2008		
	判定依据 (Criteria based on)	----		
<b>检验结论 (Conclusion)</b>				
传热系数: $K=0.98 \text{ W}/(\text{m}^2 \cdot \text{K})$				
保温性能: 属国标 GB/T 8484-2008 第10级				



# Energy Saving Solution

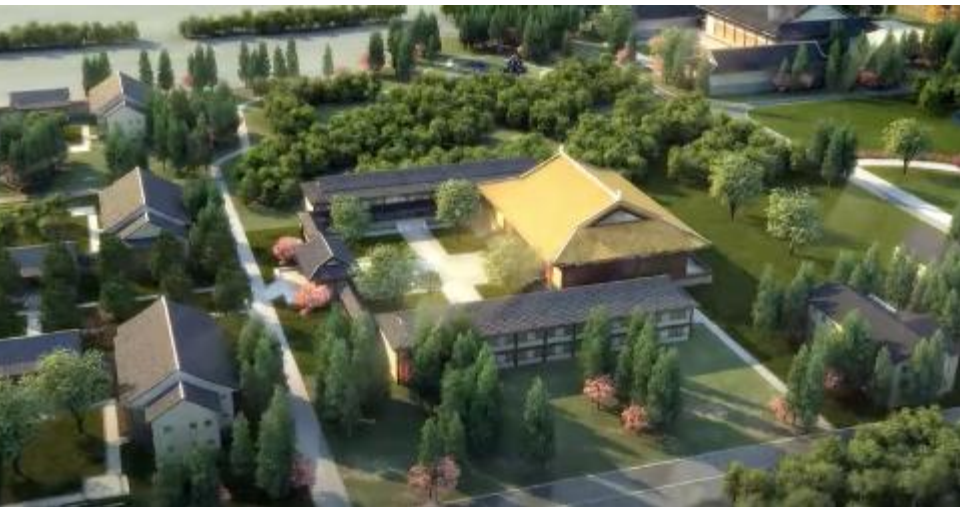
Thank you

Appendices Following:

- Our Vacuum Glass in Action
- Certifications

# Appendix: Our Vacuum Glass in Action

## CHUAN-DENG TEMPLE IN P.E.I., CANADA





# Appendix: Our Vacuum Glass in Action

## ULTRA-LOW-ENERGY BUILDING IN XINXIANG, HENAN



# Appendix: Our Vacuum Glass in Action

## RESIDENTIAL COMMUNITY IN CHANGCHUN, JILIN





# Appendix: Our Vacuum Glass in Action

## 5 STARS HOTEL IN NANYANG, HENAN



# Appendix: Our Vacuum Glass in Action

## EXHIBITION CENTER IN SHANGHAI





# Appendix: Our Vacuum Glass in Action

## PASSIVE HOUSE IN FEN' AN





# Appendix: Certifications

## TVIG CERTIFIED WITH SGCC



safety glazing certification council

P.O. BOX 730  
SACKETS HARBOR, N.Y. 13685  
PHONE: 315-646-2234  
FAX: 315-646-2297

### Acknowledgement of Certification

#### Notice of Authorization to Use the Permanent SGCC Label (SD-50)

Date: August 10, 2017

Yongqing Tian  
Henan Longwang Tempered Vacuum Glass Ltd.  
8 Sixth Avenue  
Industrial Agglomeration District  
Mengzhou, Henan 454750  
China

Plant: Henan Longwang Tempered Vacuum Glass  
Ltd. Mengzhou, Henan  
Plant Ref. No.: HEN01CH

Dear Tian:

Please be advised that as of the date of this correspondence, SGCC has received passing test reports for your prototypes listed below. Based on a review of this information, please be advised that by reports received today, certification has been approved for the following products:

SGCC#	IN	MM	Attributes	INT	Type Code	Max Size	ANSI Class	Test Std	ANSI Z97 Year
6640	1/2	12			VIGT	U	A	COMP	2015

The License Agreement requires that all items to be covered by this certification bear the permanent SGCC label (refer to the SGCC Certified Products Directory Label Requirements).

If any of the above information is incorrect, or if we may assist in any way, please contact us immediately. Thank you for your support of the SGCC Product Certification Program.

Authorization by,

John G. Kent  
Administrative Manager  
SGCC Certification Program



safety glazing certification council

Administrative Office, AMS, Inc.  
205 West Main Street, PO Box 730  
Sackets Harbor, NY 13685  
Phone: (315)646-2234  
E-mail: staff@ams-cert.com

### ACKNOWLEDGEMENT OF CERTIFICATION

THIS IS TO ACKNOWLEDGE THAT AS OF THIS DATE

**Henan Longwang Tempered Vacuum Glass Ltd.  
Mengzhou, Henan**

IS A CURRENT LICENSEE AND HAS MET ALL GUIDELINES AND REQUIREMENTS FOR THE SGCC® CERTIFICATION PROGRAM AND AS SUCH IS ELIGIBLE TO LABEL THE BELOW INDICATED PRODUCT(S) AS SGCC® CERTIFIED. REPRESENTATION SAMPLES OF THE BELOW PRODUCTS HAVE BEEN FOUND TO BE IN COMPLIANCE WITH ANSI Z97.1-2009 OR 2015 AS INDICATED, CPSC 16 CFR 1201 STANDARDS, OR BOTH STANDARDS, KNOWN AS COMPOSITE CERTIFICATION (COMP), OR BOTH STANDARDS WITH CAN/CSB 12.1 KNOWN AS COMP+CAN.

SGCC#	IN	MM	Attributes	INT	Type Code	Max Size	ANSI Class	Test Std	ANSI Z97 Year
6640	1/2	12			VIGT	U	A	COMPOSITE	2015

THIS SGCC® PROGRAM CERTIFICATION IS CURRENT AND IN FULL EFFECT AS OF THIS ISSUE DATE. CERTIFICATION IN THE SGCC® PROGRAM IS SUBJECT TO SEMI-ANNUAL RENEWAL. PLEASE CHECK THE SGCC WEBSITE AT WWW.SGCC.ORG OR THIS OFFICE FOR MOST CURRENT INFORMATION.

Wednesday, October 4, 2017  
DATE OF ISSUE

L17  
CERTIFICATION PERIOD

ADMINISTRATIVE MANAGER

# Appendix: Certifications

## CERTIFIED WITH IGMA

INSULATING GLASS  
**IGCC**<sup>®</sup>  
CERTIFICATION COUNCIL

Administrative Management Systems, Inc.  
205 West Main Street, PO Box 730  
Sackets Harbor, NY 13685  
Phone: (315) 646-2234  
Fax: (315) 646-2297  
E-mail: staff@amscert.com

**IGMA** INSULATING  
GLASS  
MANUFACTURERS  
ALLIANCE

### ACKNOWLEDGEMENT OF CERTIFICATION

THIS IS TO ACKNOWLEDGE THAT AS OF THIS DATE

**Henan Longwang Tempered Vacuum Glass Ltd.**  
Mengzhou, Henan

IS A CURRENT LICENSEE AND HAS MET ALL GUIDELINES AND REQUIREMENTS FOR THE IGCC®/IGMA® CERTIFICATION PROGRAM AND AS SUCH IS ELIGIBLE TO LABEL THE BELOW INDICATED PRODUCT(S) AS IGCC®/IGMA® CERTIFIED. THE FOLLOWING ARE IN COMPLIANCE WITH ASTM E2190 FOR SEAL DURABILITY OF INSULATING GLASS UNITS AND PASSING GAS CONTENT INITIAL AND AFTER WEATHERING (GCIA) CERTIFICATION REQUIREMENTS AS INDICATED.

<u>CERT #</u>	<u>GLASS</u>	<u>SPACER</u>	<u>FRAME CONST.</u>	<u>DESICCANT</u>	<u>SEALANT</u>	<u>GCIA</u>
4506	U/C2	VG	NA	NA	VG/	No

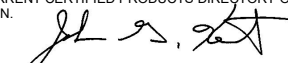
THIS IGCC®/IGMA® PROGRAM CERTIFICATION IS CURRENT AND IN FULL EFFECT AS OF THIS ISSUE DATE. CERTIFICATION IN THE IGCC®/IGMA® PROGRAM IS SUBJECT TO SEMI-ANNUAL RENEWAL. PLEASE CHECK THE CURRENT CERTIFIED PRODUCTS DIRECTORY OR THIS OFFICE FOR MOST CURRENT INFORMATION.

Monday, January 29, 2018

DATE OF ISSUE

February 1, 2018 - January 31, 2019

CERTIFICATION PERIOD

  
ADMINISTRATIVE MANAGER

# SINO GLASS TECH

Thank you

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

- E-Mail: [contact@sinoglasstech.com](mailto:contact@sinoglasstech.com)
- WhatsApp: +86-13333670044