



Crystal Units Ltd  
100 West Hendon Broadway  
London  
NW9 7AA

T: +44 208 457 4188  
E: [cuin@crystalunits.com](mailto:cuin@crystalunits.com)  
W: [www.crystalunits.com](http://www.crystalunits.com)



# Technical Information Pack





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NW9 7AA

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## Introduction

**CUIN** insulating glass units (IGU's) utilize innovative suspended film technology to achieve ultra-low centre pane U-values within double and triple glazed constructions.

**CUIN** is lighter, thinner and more environmentally friendly than traditional glazing. With excellent acoustic properties and virtually zero UV transmission, **CUIN** is the high performance glazing selection for the built environment.

The transparent uncoated film provides an invisible barrier inside the cavity of the double glazed IGU, creating two separate chambers opposed to just one in a standard double IGU. With low emissivity coatings on glass surfaces #2 & #3, combined with low conductivity gas inside the chambers, **CUIN** IGU's are more than twice as thermally efficient as a standard double IGU's. By adding another low emissivity coated glass to construct a triple IGU, the heat loss can be halved again.

This pack provides an overview of the certification and performance of CUIN. For further technical information and project specification assistance please contact Crystal Units on [cuin@crystalunits.com](mailto:cuin@crystalunits.com) or 0208 457 4188.



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100 West Hendon Broadway  
London  
NW9 7AA

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W: [www.crystalunits.com](http://www.crystalunits.com)

## **CUIN** film properties

Material:	Polyethylene terephthalate (PET)
Thickness:	50 µm
Thickness tolerance:	±2.5% (1.25µm)
Density:	1.38 g/cm <sup>3</sup>
Thermal conductivity:	0.15 W/mk
UV transmission:	<0.1%
Emissivity:	86/85%
Light transmission	88%
Recyclable:	Yes

### PSI values:

#### Standard Spacer Bar

Metal with thermal break:	0.087 W/mK
Plastic:	0.064 W/mK
Wood:	0.073 W/mK

#### Warm Edge Spacer Bar

Metal with thermal break:	0.052 W/mK
Plastic:	0.047 W/mK
Wood:	0.046 W/mK
Wood/metal:	0.050 W/mK

PSI values determined in accordance with ift guideline WA-08/1, based on the latest equivalent conductivity measurement according to ift guideline WA17 / 1. Determined under the boundary conditions (frame profiles, glazing, glass mounting depth, back covering, primary and secondary sealant) defined in the ift guideline WA-08/2 "Thermally improved spacers – Part 1: Determination of the representative Psi value for window frame profiles".



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## CUIN Ultra

### **Specification**

4mm low e 1.1 outer  
12mm Krypton 98%  
CUIN transparent film  
12mm Krypton 98%  
4mm low e 1.1 inner

IGU thickness : 32 mm  
IGU weight: 20 kg/m<sup>2</sup> (glass weight)

### **Light**

Light transmission: 70%  
Light reflection: 18%

### **Solar**

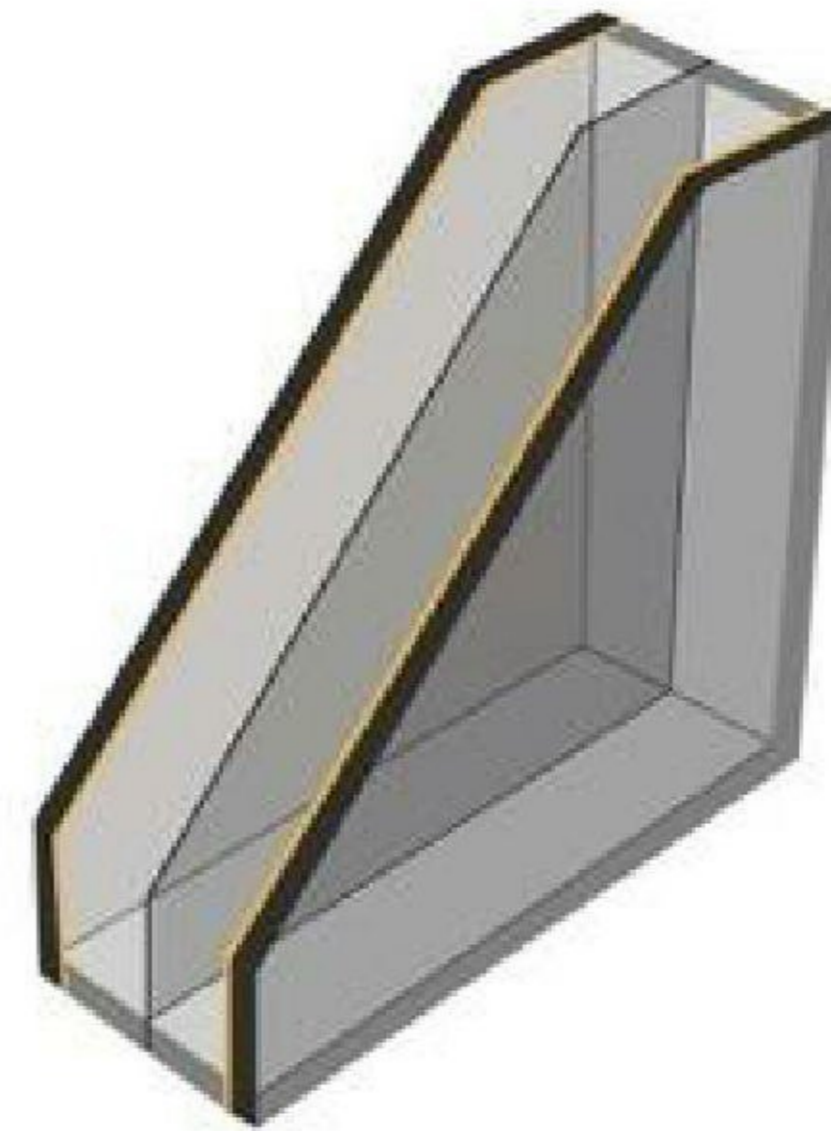
Direct transmission: 39%  
Reflection: 38%  
Absorption: 23%  
g-value: 45%

### **Shading Coefficient**

Total: 0.52  
Short wave: 0.44  
Long wave: 0.08

### **Heat transfer**

U value: 0.4 W/m<sup>2</sup>K



Light and solar data is determined in accordance with EN 410, U-value with EN 673.



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London  
NW9 7AA

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W: [www.crystalunits.com](http://www.crystalunits.com)

## CUIN Passiv

### **Specification**

4mm low e 1.1 outer  
10mm Krypton 98%  
CUIN transparent film  
10mm Krypton 98%  
4mm low e 1.1 inner

IGU thickness: 28 mm  
IGU weight: 20 kg/m<sup>2</sup> (glass weight)

### **Light**

Light transmission: 70%  
Light reflection: 18%

### **Solar**

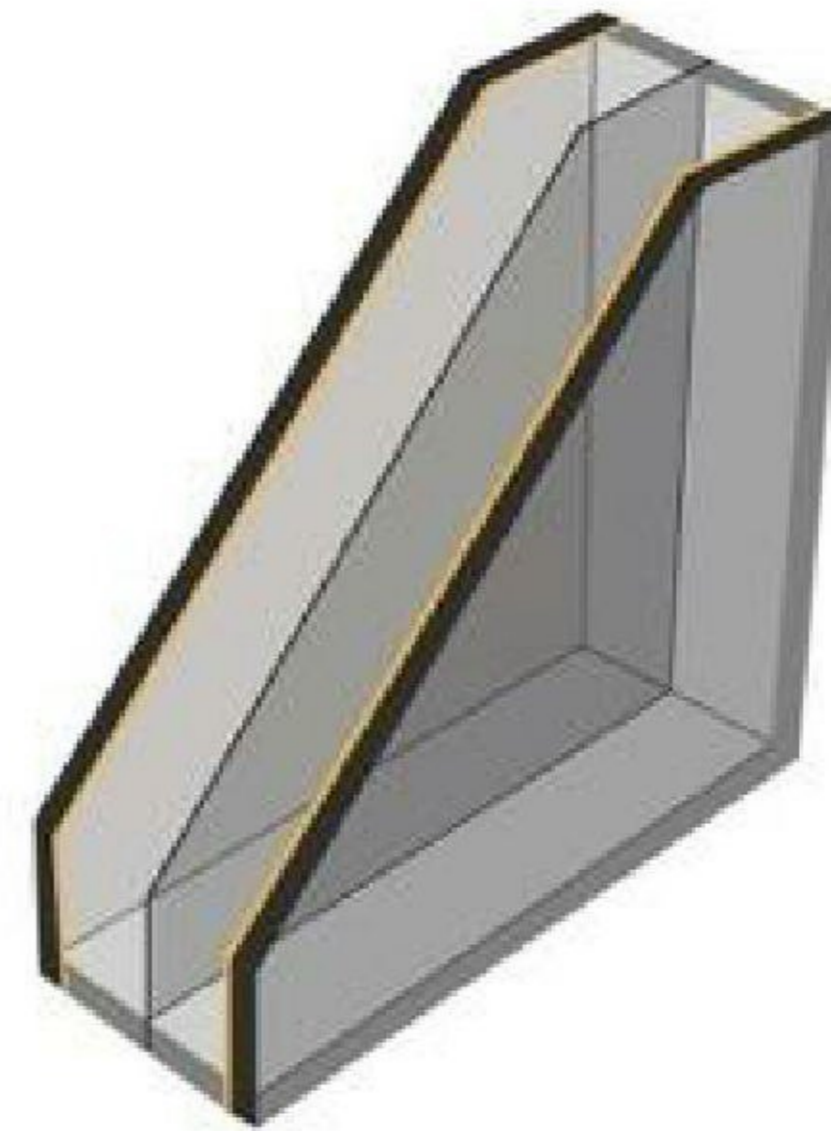
Direct transmission: 39%  
Reflection: 38%  
Absorption: 23%  
g-value: 45%

### **Shading Coefficient**

Total: 0.52  
Short wave: 0.44  
Long wave: 0.08

### **Heat transfer**

U value: 0.5 W/m<sup>2</sup>K



Light and solar data is determined in accordance with EN 410, U-value with EN 673.



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London  
NW9 7AA

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E: [cuin@crystalunits.com](mailto:cuin@crystalunits.com)  
W: [www.crystalunits.com](http://www.crystalunits.com)

## CUIN Eco

### **Specification**

4mm low e 1.1 outer  
14mm Argon  
CUIN transparent film  
14mm Argon  
4mm low e 1.1 inner

IGU thickness : 36 mm  
IGU weight: 20 kg/m<sup>2</sup> (glass weight)

### **Light**

Light transmission: 70%  
Light reflection: 18%

### **Solar**

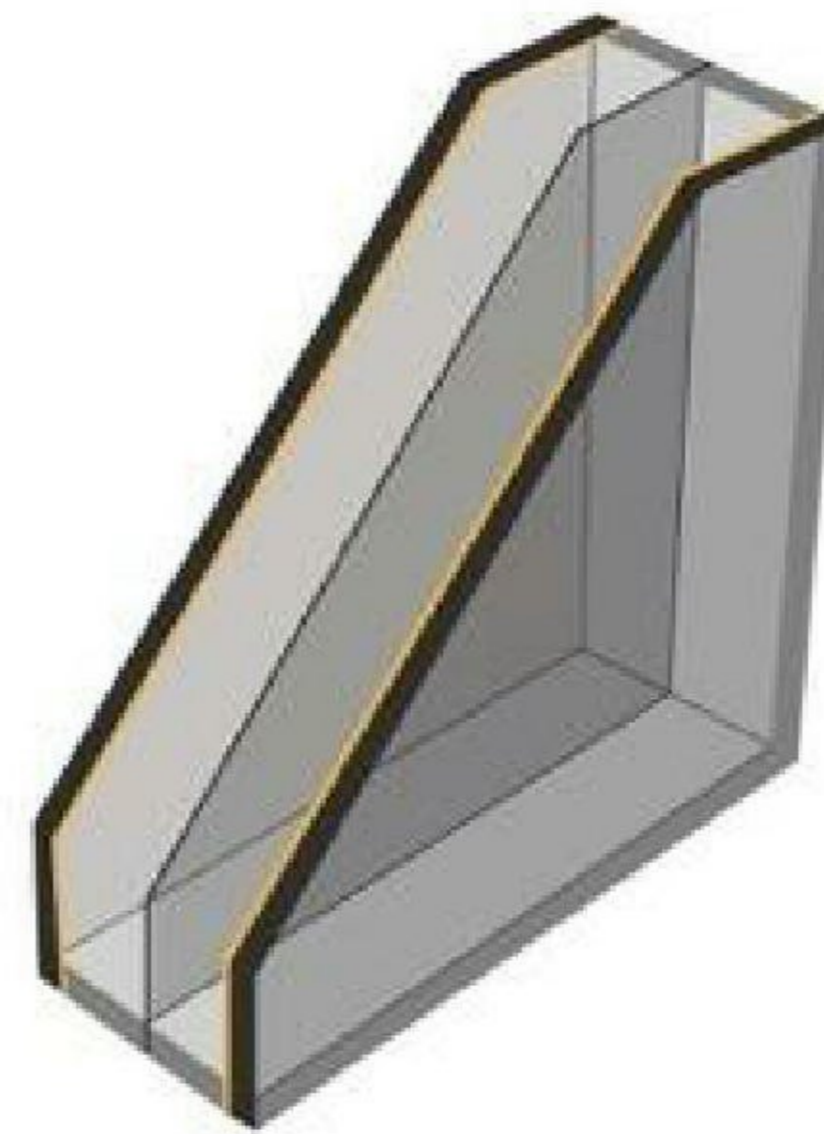
Direct transmission: 39%  
Reflection: 38%  
Absorption: 23%  
g-value: 45%

### **Shading Coefficient**

Total: 0.52  
Short wave: 0.44  
Long wave: 0.08

### **Heat transfer**

U value: 0.6 W/m<sup>2</sup>K



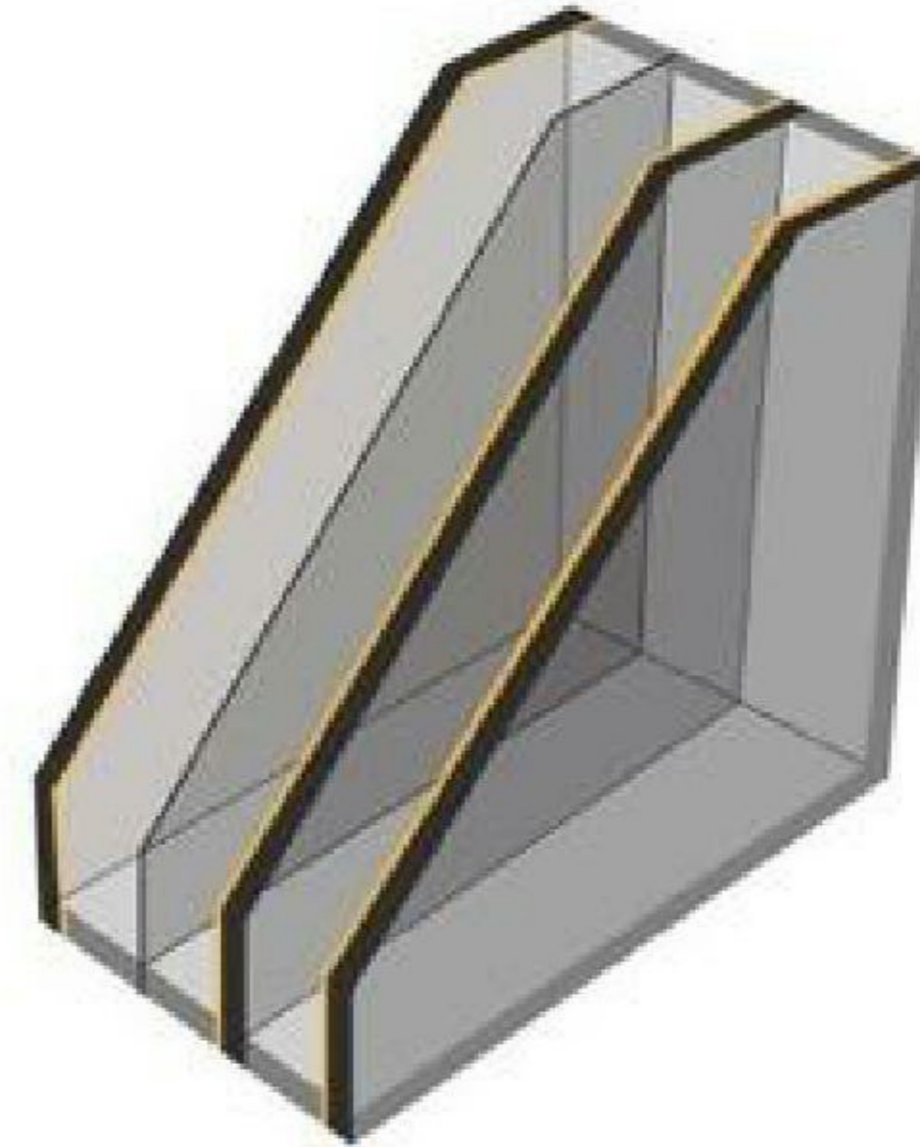
Light and solar data is determined in accordance with EN 410, U-value with EN 673.

## CUIN Vision Wall

### Specification

4mm SunGuard SN 70/35 outer  
14mm Krypton 98%  
CUIN transparent film  
14mm Krypton 98%  
4mm low e 1.1 centre  
14mm Krypton 98%  
4mm low e 1.0 inner

IGU thickness : 54 mm  
IGU weight: 30 kg/m<sup>2</sup> (glass weight)



### Light

Light transmission: 49%  
Light reflection: 24%

### Solar

Direct transmission: 15%  
Reflection: 51%  
Absorption: 34%  
g-value: 22%

### Shading Coefficient

Total: 0.26  
Short wave: 0.17  
Long wave: 0.09

### Heat transfer

U value: 0.2 W/m<sup>2</sup>K

Light and solar data is determined in accordance with EN 410, U-value with EN 673.





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**Report in Accordance with  
BS EN 673: 2011**

**Glass in building - Determination of  
thermal transmittance (U value) -  
Calculation Method**

**CONFIDENTIAL**

Report reference: CU16048-1 Rev1  
Issue date: 3 March 2016  
Prepared for: Crystal Units  
100 West Hendon  
Broadway  
Hendon  
London NW9 7AA  
Prepared by: Richard Bate

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## 1 Introduction

This document details the centre pane thermal performance of five glazed units detailed below which was commissioned by Phil Hallworth of Crystal Units.

## 2 Specification

Glazing unit	Overall size	Outer pane	Centre pane	Inner pane	Cavity
1 (Eco 10)	28.1mm	4mm low-e, normal emissivity 0.03	0.1mm CUIN, normal emissivity 0.85/0.86	4mm low-e, normal emissivity 0.03	2x 10mm, 35% argon, 60% krypton, 5% air
2 (Passiv)	28.1mm	4mm low-e, normal emissivity 0.03	0.1mm CUIN, normal emissivity 0.85/0.86	4mm low-e, normal emissivity 0.03	2x 10mm, 95% krypton, 5% air
3 (Ultra)	32.1mm	4mm low-e, normal emissivity 0.03	0.1mm CUIN, normal emissivity 0.85/0.86	4mm low-e, normal emissivity 0.03	2x 12mm, 98% krypton, 2% air
4 (Eco 14)	36.1mm	4mm low-e, normal emissivity 0.03	0.1mm CUIN, normal emissivity 0.85/0.86	4mm low-e, normal emissivity 0.03	2x 14mm, 95% argon, 5% air

Glazing Unit	Overall Size	Outer panel	Pane 2	Pane 3	Inner pane	Cavity
5 (Vision Wall)	54.1mm	4mm low-e normal emissivity 0.03	0.1mm CUIN normal emissivity 0.85/0.86	4mm low-e, normal emissivity 0.01	4mm low-e, normal emissivity 0.01	3x 14mm, 98% krypton, 2% air

## 3 Summary of Results

### 2.1 Centre pane U-Value of glazing calculated in accordance with BS EN 673: 2011

Glazing unit	Centre pane U-value ( $U_g$ )
1 (Eco 10)	0.6 W/m <sup>2</sup> K
2 (Passiv)	0.5 W/m <sup>2</sup> K
3 (Ultra)	0.4 W/m <sup>2</sup> K
4 (Eco 14)	0.6 W/m <sup>2</sup> K
5 (Vision Wall)	0.2 W/m <sup>2</sup> K

For further information see Annex A



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London  
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E: [cuin@crystalunits.com](mailto:cuin@crystalunits.com)  
W: [www.crystalunits.com](http://www.crystalunits.com)



### 3 Authorisation

	Issued by:	Checked by:
Signature:		
Name:	Richard Bate	Sue Peatey
Title:	Technical Director	Certification Manager

Revision 1 – June 2016 – revised report CU16048-1 by amending date of the Standard, BS EN 673, to 2011 on the five calculations.

**Psi values for windows**

Determination of representative psi values for window frame profiles following the principles of IFT guideline WA-08engl/3



November 2016 – Document Ref: CU16419-1

For	Description of Glass Unit
Crystal Units Ltd 100 West Hendon Broadway, Hendon, London, NW9 7AA	4-12-4-12-4 triple glazed unit, incorporating Thermoseal Thermobar spacer (inner cavity) and Rolltech Ferrotech spacer (outer cavity) and 3mm Polysulfide/Polyurethane secondary seal

**Thermoseal Thermobar**

Dimensions (mm)	Description	Thickness (mm)	Drawing
6.5 high x 11.5 wide	Modified polypropylene glass filled / Modified polyester film	1.0 / 1.2  0.027	

**Rolltech Ferrotech**

Dimensions (mm)	Description	Thickness (mm)	Drawing
6.5 high x 11.5 wide	Steel / Molecular sieve desiccant core	0.38	

**Representative Psi value**

	 Triple-glazing - $U_g=0.7 \text{ W/m}^2\text{K}$
 Metal with thermal break	0.052 W/mK
 Plastic	0.047 W/mK
 Wood	0.046 W/mK
 Wood and Metal	0.050 W/mK

**Build Check Ltd**  
Montrose House, Lancaster Road, Cressex Business Park, High Wycombe, Bucks, HP12 3PY  
Tel: +44 (0)1494 452713, E-mail: [info@buildcheck.co.uk](mailto:info@buildcheck.co.uk), Web: [www.buildcheck.co.uk](http://www.buildcheck.co.uk)

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**Psi values for windows**

Determination of representative psi values for window frame profiles following the principles of IFT guideline WA-08engl/3



November 2016 – Document Ref: CU16419-1

**Two box model characteristic values – Thermoseal Thermobar**

Space between panes (mm)	$\lambda_{eq,2B}$ in W/mK	
	Spacer - height1 = 6.5mm	Secondary Sealant - height2 = 3mm
Valid for all spacer widths 	0.14	0.40

The above two box method follows the principles of IFT guideline WA-17/1 "Thermally improved spacers – Determination of the equivalent thermal conductivity by measurement" and IFT guideline WA-08engl/3 "Thermally improved spacers – Part 1: Determination of the representative Psi value for window frame profiles".

**IKATES, s.r.o. - Zkušebna skla a stavebních výrobků**



**Tolstého 186, 415 03 Teplice**  
tel. : +420 417 503 093, tel./fax: +420 417 502 825  
e-mail: [ikates@volny.cz](mailto:ikates@volny.cz), <http://go.to/ikates>



*Notifikovaná zkušební laboratoř č.1394*

*Akreditovaná zkušební laboratoř č.1139*

*akreditovaná ČIA Praha ke zkouškám skla a vybraných stavebních výrobků*

## PROTOKOL O ZKOUŠCE

**Evidenční číslo : A – 56A / 2007**

**Předmět zkoušky :** **Fólie pro použití v izolačních sklech HMsol**  
- stanovení světelných a solárních parametrů podle ČSN EN 410  
- stanovení emisivity podle ČSN EN 673

**Objednatel (adresa):** IZOLAČNÍ SKLA a.s., Staňkova 18, Brno

**Výrobce (adresa):** neuveden, dovozce do ČR: IZOLAČNÍ SKLA a.s.,  
Staňkova 18, Brno

**Místo provedení zkoušky :** IKATES, s.r.o., Teplice, Sklářský ústav Hradec Králové s.r.o.

**Datum přijetí zakázky:** 23.2.2007

**Datum provedení zkoušky :** 2.3. - 26.3.2007

**Datum vystavení protokolu :** 4.5.2007

**Počet stran :** 3

**Strana číslo :** 1

**Vedoucí laboratoře :**



Výsledky a/nebo informace, které jsou mimo rozsah akreditace, a subdodávky jsou v protokolu označeny. Pořizování kopií a překladů, použití protokolu pro jiné další účely (reklamy, výtahy z protokolu) jen se souhlasem laboratoře. Bez souhlasu laboratoře je možné protokol reprodukovat jen jako celek.

<b>Evidenční číslo : A - 56A / 2007</b>	<b>Počet stran : 3</b>
	<b>Strana číslo : 2</b>

**Normativní podklady :**

ČSN EN 410 (2000) : Sklo ve stavebnictví. stanovení světelných a slunečních charakteristik zasklení.

ČSN EN 673 (2002): Sklo ve stavebnictví - Stanovení součinitele prostupu tepla (hodnota  $U$ ) - Výpočtová metoda (včetně změny A1 a A2)

**Odběr vzorků :**

Ke stanovení charakteristik byly dodány 2 vzorky čiré PET-fólie pro použití v izolačních sklech o rozměrech 210x300 mm o tloušťce 75  $\mu$ m s označením **HMsol**

**Metrologické zabezpečení zkoušek :**

Světelné charakteristiky byly stanoveny na spektrofotometru Perkin Elmer Lambda 2, metrologicky navázaném na etalony ČMI Praha, Perkin Elmer a Labsphere Inc.. Spektra v oblasti slunečního záření byla měřena akreditovanou zkušební laboratoří Sklářský ústav Hradec Králové s.r.o. na přístroji Perkin Elmer 9 a vyhodnocena laboratoří IKATES, s.r.o.

Stanovení emisivity bylo provedeno pomocí spektrometru Specord M80, navázaného na referenční povlak zlata a certifikované zrcadlo OGS33 od National Physical Laboratory.

**Výsledky zkoušek :**

**Světelné a solární charakteristiky a emisivita (ČSN EN 410 a ČSN EN 673)**

vzorek	$\tau_{UV}$ (%)	$\tau_V$ (%)	$\rho_V / \rho'_V$ (%)	$\tau_E$ (%)	$\rho_E / \rho'_E$ (%)	$\epsilon$ (ext/int) (%)
<b>HMsol</b>	< 0,1	88,2	12,2 / 11,2	83,9	11,4 / 11,8	86,1 / 85,1

Poznámky:  
Geometrie měření : 0/0 (prostup), 8/d (odraz)

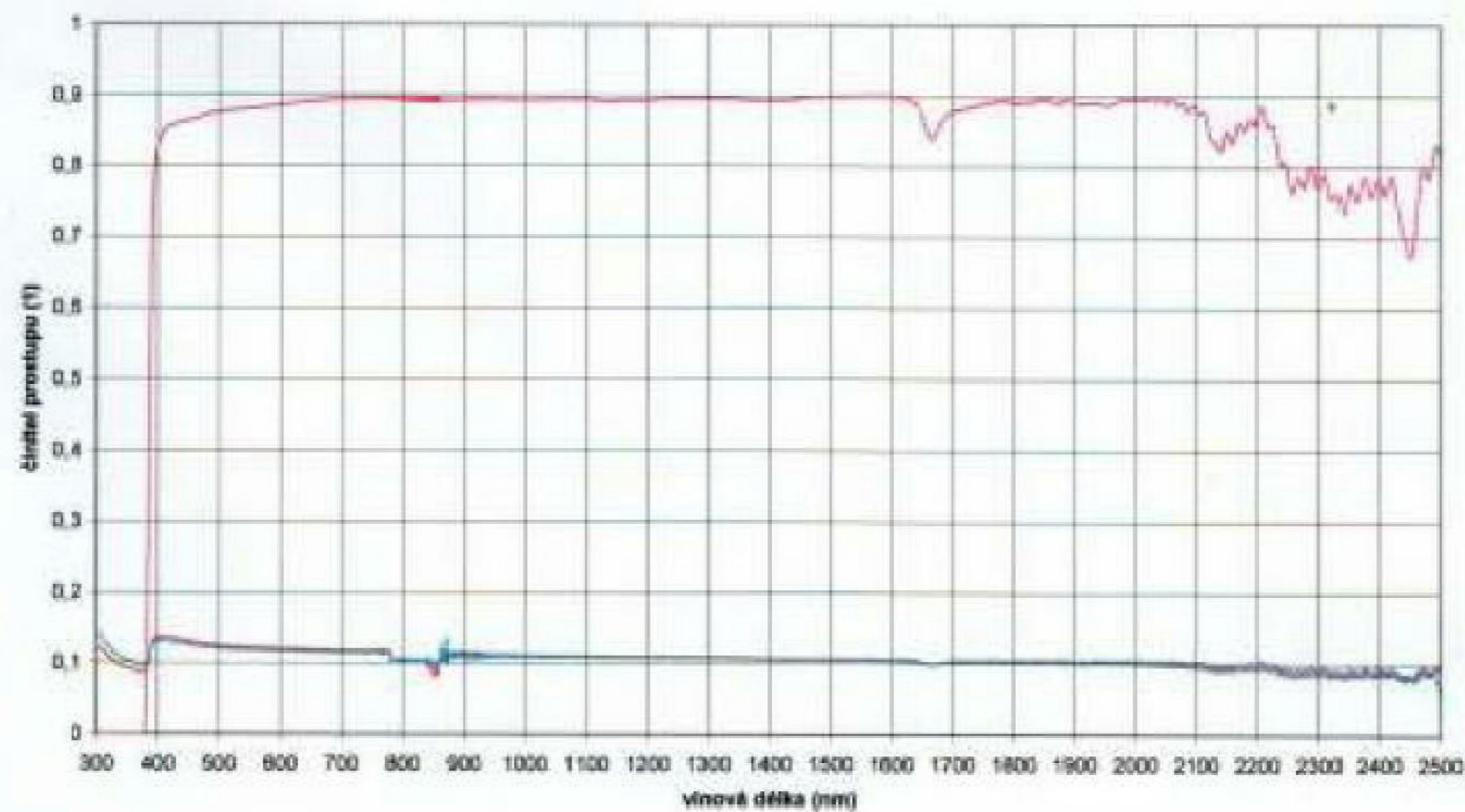


Evidenční číslo : A - 56A / 2007

Počet stran : 3

Strana číslo : 3

Spektra fólie HMsol v prostupu a odrazu



**Prohlášení :** Výsledky zkoušek, uvedené v tomto protokolu se týkají pouze předmětu zkoušky a nenahrazují jiné dokumenty, např. správního charakteru, vydávané jinými orgány podle zvláštních předpisů.

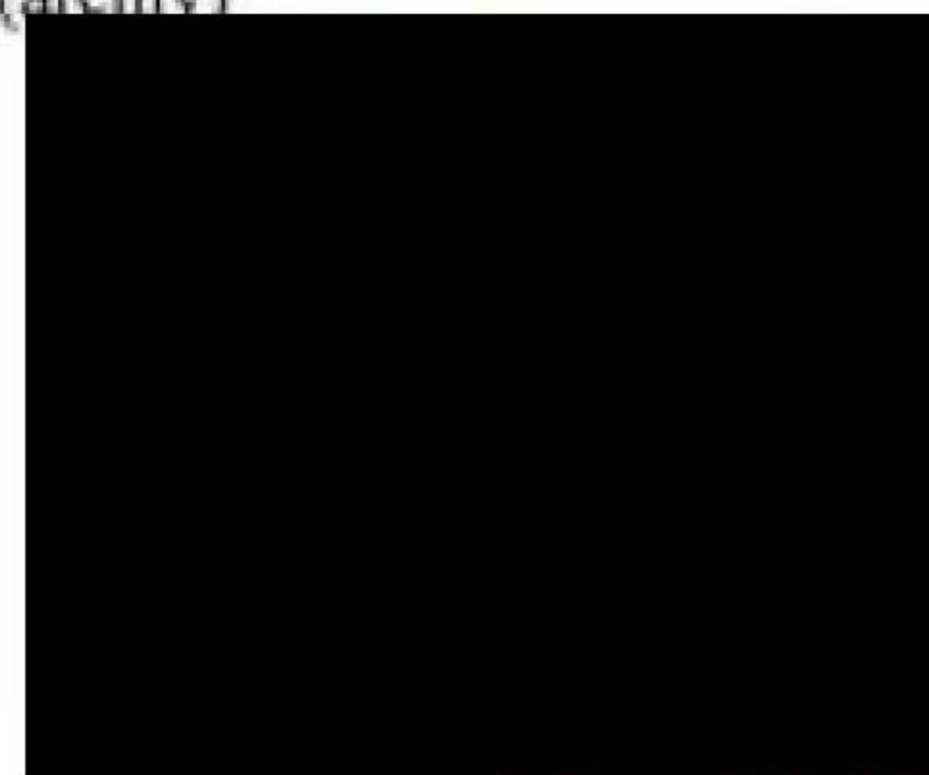
**Rozdělovník :**

2 x IZOLAČNÍ SKLA a.s., Staňkova 18, Brno

1 x Zkušebna skla a stavebních výrobků IKATES, s.r.o. (archiv)

Zkoušky provedl, protokol vyhotovil

a za správnost a platnost protokolu odpovídá :





**Annex of test report No. 320A / 2015**

**IKATES, s.r.o. – Laboratory for glass and building products testing**



**Tolstého 186, 415 03 Teplice, Czech Republic**

tel. : +420 417 503 093 / +420 417 502 825

e-mail: [ikates@ikates.cz](mailto:ikates@ikates.cz), [www.ikates.cz](http://www.ikates.cz)

**Summary report No. 320AS/2015 Date: 2016-06-20**

**Insulating glass units – Moisture penetration results according to EN 1279-2**

For details, see the test report No. 320A / 2015

Company : Crystal Units Ltd  
100 West Hendon Broadway  
London NW9 7AA, UK

Plant : Crystal Units Ltd  
100 West Hendon Broadway  
London NW9 7AA, UK

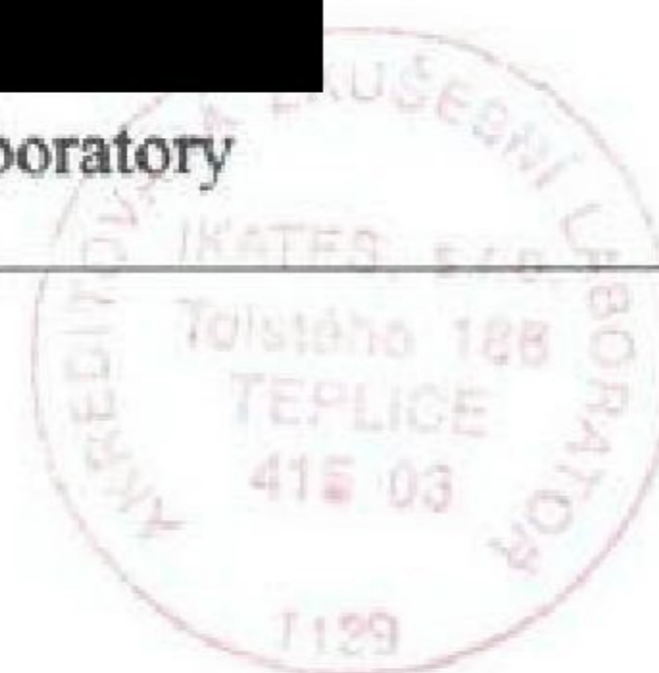
System description, file number: „IGU production system description“

Product name: Insulating glass unit

System conforms: 

YES	NO
-----	----

manager of testing laboratory



**Annex of test report No. 320B / 2015**

**IKATES, s.r.o. – Laboratory for glass and building products testing**



Tolstého 186, 415 03 Teplice, Czech Republic  
tel. : +420 417 503 093, tel./fax: +420 417 502 825  
e-mail: [ikates@ikates.cz](mailto:ikates@ikates.cz), [www.ikates.cz](http://www.ikates.cz)

**Summary report No. 320BS/2015 Date: 2016-06-20**

**Insulating glass units – Evaluation of the gas leakage rate and gas concentration measured according to EN 1279-3**

For details, see the test report 320B/2015

Company : Crystal Units Ltd  
100 West Hendon Broadway  
London NW9 7AA, UK

Plant Crystal Units Ltd  
100 West Hendon Broadway  
London NW9 7AA, UK

System description: IGU system description  
Product name: Insulating glass unit CUIN

Applied gas:	argon	
Unit number:	1	2
Measured concentration $c_{Ar}$ (%):	87,0	89,5
Nominal concentration $c_{Ar,0}$ (%)	90	90
Gas leakage rate $L_{Ar}$ (%.a <sup>-1</sup> )	0,45	0,36

System conforms 

YES	NO
-----	----

manager laboratory

end of the test report





**Crystal Units Ltd**  
100 West Hendon Broadway  
London  
NW9 7AA

T: +44 208 457 4188  
E: [cuin@crystalunits.com](mailto:cuin@crystalunits.com)  
W: [www.crystalunits.com](http://www.crystalunits.com)



By Royal Charter

## Kitemark™ Certificate

This is to certify that:

Crystal Units Ltd  
100 West Hendon Broadway  
Hendon  
London  
NW9 7AA  
United Kingdom

Holds Certificate Number:

KM 54505

In respect of:

**BS EN 1279-2 & BS EN 1279-3**  
**Insulating Glass Units**

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.

For and on behalf of BSI:

  
Gary Fenton, Global Product Certification Director

First Issued: 14/11/2000

Latest Issue: 16/02/2017



Page: 1 of 2

...making excellence a habit.™

This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.  
To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated [online](#).

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.  
A member of BSI Group of Companies.



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100 West Hendon Broadway  
London  
NW9 7AA

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E: [cuin@crystalunits.com](mailto:cuin@crystalunits.com)  
W: [www.crystalunits.com](http://www.crystalunits.com)

## Kitemark™ Certificate

No. KM 54505

**BS EN 1279-2:2002 - Insulating Glass Units. Long Term test method and requirements for moisture penetration.**

**BS EN 1279-3:2002 - Insulating Glass Units. Long Term test method and requirements for gas leakage rate and for gas concentration tolerances.**

This Kitemark Certificate is valid only for units manufactured using the components listed on the following System Descriptions and covers Plain units & internal film only.

- System Description Reference – CU 0103\HM – Dated 27 October 2003**
- System Description Reference –CU 0203\PUR-TT – Dated 27 October 2003**
- System Description Reference – CU 0303/PUR/TP - Dated 27 October 2003**
- System Description Reference – CU 0403/SG – Dated 27 October 2003**
- System Description Reference – CU 0505/PUREMC – Dated 24 March 2005**
- <sup>1</sup> System Description Reference - CU Triseal - Dated - 24 January 2008**
- <sup>2</sup> System Description Reference - CU0410 HM Pt3 - Dated – 16 October 2010**
- <sup>3</sup> System Description Reference - CUIN 1016 - Dated – 14 February 2017**

**<sup>1</sup> Triseal Units only (BS EN 1279 Part 3)**

**<sup>2</sup> Aluminium spacer, EMC PIB, Bostik 5000 (BS EN 1279 Part 3)**

**<sup>3</sup> Energyin s.r.o Internal film**

First Issued: 14/11/2000

Latest Issue: 16/02/2017

Page: 2 of 2

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A member of BSI Group of Companies.

**Anne IKATES, s.r.o. – Laboratory for glass and building products testing**



Tolstého 186, 415 03 Teplice, Czech Republic  
tel.: +420 417 503 093, tel.: +420 417 502 825  
e-mail: [ikates@ikates.cz](mailto:ikates@ikates.cz), [www.ikates.cz](http://www.ikates.cz)



Testing laboratory No. 1139 accredited by Czech Accreditation Institute  
acc. to ČSN EN ISO(IEC 17025 for glass and selected building products testing

**TEST REPORT**

No. : 122 / 2016

**For** Test item : **Insulating glass units CUIN**  
- radiation test according to ČSN EN ISO 12543-4

**Co** Client (address): Crystal Units Ltd  
100 West Hendon Broadway,  
London NW9 7AA, UK

**Pla** Producer (address): Crystal Units Ltd  
100 West Hendon Broadway,  
London NW9 7AA, UK

**Sys** Place of test performance : testing laboratory IKATES, s.r.o., Teplice

**Pro** Date of sample receiving : 2016-05-06

Date of test performance : 2016-05-06 to 2016-08-11

**Apf** Date of issue :

**Uni**

**Me** Manager of testing laboratory :

**Nor**

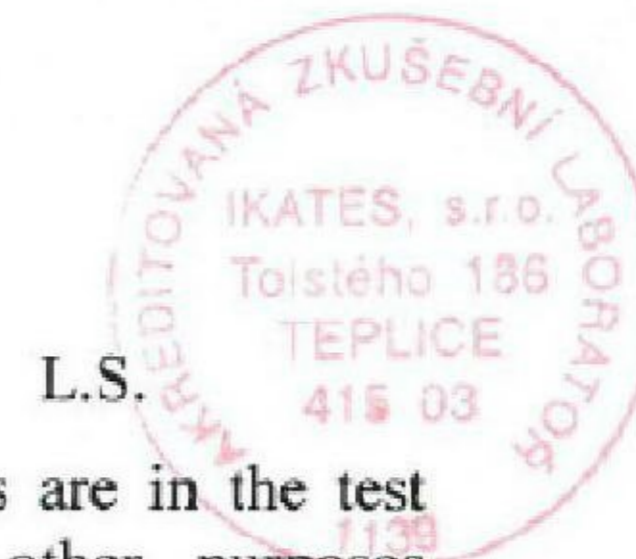
**Gas** Results and/or information out of accreditation range and subcontracts are in the test report identified. Copying and translating, using of report for other purposes (advertisement, extracts from the report) only with consent of the laboratory. Without consent of the laboratory can be this report reproduced whole only.

System conforms

YES	NO
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mana... laboratory

end of the test report



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**Normative foundations :**

ČSN EN ISO 12543 (2012): Glass in building – Laminated glass and laminated safety glass

**Sampling :**

Three test specimens with dimensions 200x300 mm were supplied to testing:

**Low-E coated glass 4 mm / 6 mm / Energy In film / 6 mm / Low-E coated glass 4 mm**

Components list:

glass – Low-E coated glass 4 mm according to EN 1096-4

spacer – steel, 6 mm, Ferrotech, Rolltech a.s., bended

desiccant – molecular sieve Molsic 3A 0,5-0,9mm Wuxi Seily; filling: long and short

inner sealant – polyisobutylene GD 115, Kömmerling, seal width 4 mm

outer sealant – polyurethane GD 677, Kömmerling, seal width 7 mm (measured on glass)

gas – Argon 5,0, 90 %, filled through the drilled holes

**Metrological provision of tests :**

The radiation test was carried out using of testing equipment – radiation wall with Ultravitalux lamps. The light transmittance of samples before and after the test was measured using of spectrometer Perkin Elmer with metrological traceability. Irradiance was measured with pyranometer Kipp & Zonen CM-6B with metrological traceability, the temperature using of calibrated thermocouple.

**Test results :**

**Radiation test (ČSN EN ISO 12543-4; 7.3.1)**

Duration: 2000 hours; sources: 16 pcs. of OSRAM Ultravitalux 300 W

Note: The test was carried out on the IGU's based on request of customer. The target of the test was to test the stability of incorporated film under solar radiation.

None from tested specimens shows visually observable changes in the evaluated area.

Sample No.	Light transmittance before and after the test		Rel. difference (%)
	$\tau_{V1}$ (l)	$\tau_{V2}$ (l)	
1	0,71	0,71	0
2	0,71	0,71	0
3	0,71	0,71	0

Note: According to ČSN EN 12543-2, art. 4.3 is the allowable difference max.  $\pm 3$  % rel.



**Crystal Units Ltd**  
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W: [www.crystalunits.com](http://www.crystalunits.com)

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**Statement :** Test results, given in this report, apply only to the tested items and do not replace other documents, e.g. administrative character, issued by other bodies, according to particular regulations. The official version is in Czech language.

**Distribution list :**

2 x Crystal Units Ltd

1 x Laboratory for glass and building products testing IKATES, s.r.o. (archive)

**Tests were carried out by :**

Jiří Snajdr, Jiří Stránský

**Report was performed by :**

**For correctness and validity of report is responsible :**

end of the test report



**Crystal Units Ltd**  
 100 West Hendon Broadway  
 London  
 NW9 7AA

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## Rating of Sound Insulation

Glazing	Interlayer	Thickness [mm]	Rw [dB]	Rw + C	Rw + Ctr [dB]	Rw (C;Ctr)
4/12/CUIN/12/4	x	32	<b>35</b>	33	29	35 (-2;-6)
4/16/CUIN/16/4	x	40	<b>36</b>	34	29	36 (-2;-7)
4/12/CUIN/12/6.8	PVB	35	<b>39</b>	37	32	39 (-2;-7)
6/12/CUIN/12/8.8 (44.2)	PVB	39	<b>41</b>	39	35	41 (-2;-6)
6/12/CUIN/12/8.8 (44.2)	Acoustic	39	<b>42</b>	40	36	42 (-2;-6)

All data has been measured in accordance with EN 140-3 and ISO 717-1.  
 Test Reports available upon request.





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Safety data sheet

BL 025 - 10A

## BO PET film

28.03.2013

Issue: 1

### 1 Identification of the substance/mixture and company/undertaking

#### 1.1 Identification of substance/mixture

Trade name : **BoPet film**

Chemical name: no (article)

BOPET film is article according to Article 3.3 of Regulation (EC) No. 1907/2006 (REACH).

They do not contain substances intended to be released under normal or reasonably foreseeable conditions of use. Therefore, there is no registration obligation for substances in articles according to Article 7.1 of the Regulation. There is no obligation to provide a Safety Data Sheet for this product in the sense Article 31 of the Regulation. In this document there is recommendation for safety and protection of health at work with article BoPet film

#### 1.2 Use of the substance/mixture

BOPET is used for :

The first letter designates the application field :

- – flexible packaging production
- I – electrical insulations
- S – separative film
- P – film for roasting
- D – film for decoration, advertisement, labels
- T – film for polygraphic industry

An example : BO PET IA 0001/19.....

BO PET ○AN 0001/23.....

#### 1.3 Company/undertaking identification

- Address of the producer :

#### 1.4 Emergency telephone numbers in case of accident

- Centre of the Czech Ministry of Health

Toxicological Information Centre Prague - Czech Republic

Tel: +420 224 919 293

+420 224 915 402

### 2 Hazards identification

2.1

#### Classification of the substance or mixture

Product is not classified as dangerous according to No 1907/2006/EC. In this product is presented no SVHC substance according to ECHA list published on web <http://www.echa.europa.eu/cs/candidate-list-table>

#### 2.2 Label elements

Labelling according to 67/548/EEC and 1272/2008/EC : no

#### 2.3 Other hazards



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Criteria for PBT, vPvB : Product does not meet the criteria for PBT, vPvB.  
Other hazard : In case of fire are released toxic and irritating fumes.

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### **3 Composition/Information on ingredients**

Product is not classified as dangerous according to No 1272/2008/EC.

---

#### **4 First aid measures**

##### **4.1 General advice**

None measures needed.

##### **4.2 Inhalation**

None measures needed.

##### **4.3 Skin contact**

None measures needed. If burned by a contact with melted material, cool as quickly as possible.

Do not peel material from skin.

##### **4.4 Eye contact**

If small particles of film entered the eyes, rinse the eyes with running water.

##### **4.5 Ingestion**

Ingestion is very unlikely. No danger of toxicity.

---

#### **5 Fire-fighting measures**

##### **5.1 Suitable extinguishing media**

Suitable - all usual extinguishing media.

##### **5.2 Extinguishing media to be avoided**

Unsuitable - water.

##### **5.3 Caution about specific danger in case of fire-fighting procedures**

When burning, creation of carbon dioxide, carbon monoxide.

##### **5.4 Special protective equipment for fire-fighters**

Wear chemical splash suit and self-contained breathing apparatus.

---

#### **6 Accidental release measures**

##### **6.1 Person-related safety precautions**

None measures required.

##### **6.2 Precautions for protection of the environment**

None measures required.

##### **6.3 Recommended methods for cleaning and disposal**

BoPet film can be recycled, deposited in a landfill or incinerated. In case of being BoPet film polluted through hazardous matters, disposal in accordance with valid local or national legislative regulations.

---

#### **7 Handling and storage**

##### **7.1 Handling**

No special measures necessary if used correctly. Observe all fire-fighting measures. Keep from a contact with oxidizing materials.

##### **7.2 Storage**

Storerooms should meet the requirements for the fire safety of constructions and electrical facilities and should be in conformity with valid regulations. Store in dry, dust-free and roofed storerooms.

Store in the closed original packaging at the temperatures of +5 °C to +30 °C.

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#### **8 Exposure controls/personal protection**

##### **8.1. Exposure limit values**

Not set.

##### **8.2 Exposure controls**

###### **8.2.1 Occupational exposure controls**

Respiratory protection: not required

Hand protection: not required



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Eye protection: not required  
Skin protection: not required

---

## **9 Physical and chemical properties**

### **9.1 General information**

Physical state at 20 °C: solid  
Colour: colour or colourless  
Odour: odourless

### **9.2 Important health, safety and environmental information**

pH value: not applicable  
Boiling point [°C]: not set  
Lower explosion limit [g/m<sup>3</sup>]: not applicable  
Oxidising properties: not applicable  
Vapour pressure at 20 °C [kPa]: not applicable  
Density [g/cm<sup>3</sup>]: >1  
Solubility in water at 20°C [g/l]: insoluble  
Solubility in fats at 20 °C [g/l]: not applicable

### **9.3 Other information**

Melting point [°C]: > 200  
Flashpoint [°C]: > 300  
Decomposition temperature [°C]: 330 - 350

---

## **10 Stability and reactivity**

### **10.1 Conditions to avoid**

Bo Pet film is at normal temperature non-reactive.  
Conditions to avoid: sparks, naked flame.

### **10.2 Materials to avoid**

Oxidizing materials.

### **10.3 Hazardous decomposition products**

Is decomposed by strong anorganic acid, chlorinated acetic acid, chlorinated hydrocarbon, pfenol and cresols. Thermal decomposition : at high temperature above +330 to +350 °C creation of carbon dioxide, carbon monoxide.

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## **11 Toxicological information:**

At conditions of the ordinary using, BoPet film has no acute and chronic adverse reactions on the health.

---

## **12 Ecological information**

### **12.1 Ecotoxicity**

At conditions of the ordinary using, BoPet film is not hazardous for living environment.

### **12.2 Mobility**

Not applicable.

### **12.3 Persistence and degradability**

BoPet film is not biological dissoluble.

### **12.4 Bioaccumulative potential**

Not applicable.

### **12.5 Results of PBT assesment**

Not applicable.

### **12.6 Other adverse effects**

Not applicable.

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## **13 Disposal considerations**

### **13.1 Recommended disposal methods for substance/mixture**



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Disposal in accordance with valid legislative regulation. Clean waste can be recycled.  
Waste not suitable for recycling can be deposited in a landfill. Waste polluted by dangerous substance are necessary to dispose by combustion in the refuse incinerating plant.

**13.2 Recommended disposal methods for contaminated packaging**

Contaminated packaging disposal in accordance with valid legislative regulations.

**13.3 Legal regulations governing the disposal and handling of waste**

*The Czech Republic*

Act No. 185/2001 Coll. on waste modifying certain other acts, in valid wording including delegated legislative (e.g. Decree No.381/2001 Coll. determining the Catalogue of Waste).

*The European Union*

EP and Council Directive 2006/12/EC on waste

Council Directive 1991/689/EHS on dangerous waste

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**14 Transport information**

**14.1 Transport classification**

Not dangerous goods in conformity with in transport regulation (ADR/RID)

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**15 Regulatory information**

*European Union :*

Regulation No 1907/2006 /EC of the European Parliament and of the Council, as amended,  
Regulation No 1272/2008/EC of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation /EC/ No 1907/2006, as amended,  
Council Directive 1991/689/EHS on hazardous waste, as amended,  
EP and Council Directive 2006/12/ES on waste, as amended,

*Czech Republic:*

Act No. 254/2001 Coll., regarding water resources, as amended

Act No. 185/2001 Coll., regarding waste, as amended

Decree of the Czech Ministry of Environmental Protection No. 381/2001 Dig. (Catalogue of Waste)

Act No. 258/2000 Coll. on the protection of public health amending certain related acts, as amended,

Government Decree No. 9/2013 Coll. determining the conditions of the protection of health at work, as amended.

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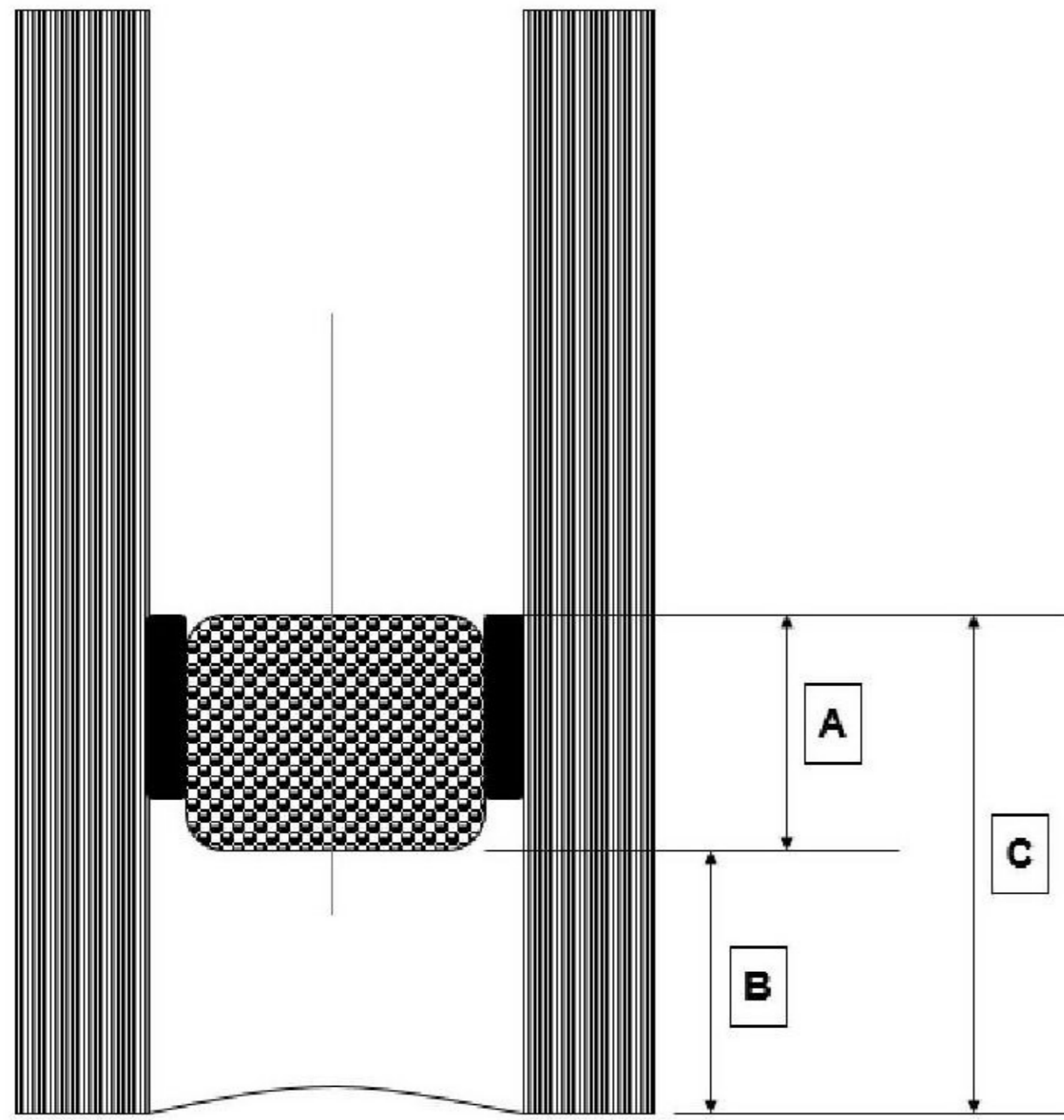
**16 Other information**

- In this document there is recommendation for safety and protection of health at work with article BoPet film

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**END**

## CUIN IGU Seal Depth



A = spacer depth - 6.5mm

B = seal depth

C = sightline

High aspect ratio <b>CUIN</b> IGU's		
IGU's with ratio (length:width) exceeding 4:1		
area (m <sup>2</sup> )	seal depth	sightline (mm ±2)
≤0.8	5,5	12
0.81 - 1.5	7	13.5
1.51 - 2.2	9	15.5
>2.2	11	17.5
length dimension (mm)	seal depth	sightline (mm ±2)
≤1500	5,5	12
1501 - 2000	7	13.5
2001 - 3000	9	15.5
>3000	11	17.5

- **CUIN** IGU's with aspect ratio exceeding 5:1, two year warranty only will be applicable for the visual quality of the transparent film.
- Dimensions exceeding 1:6 are not possible with **CUIN** IGU's.
- If a pane size falls into more than one section, the largest seal depth should be applied,
- Example - pane size 750mm x 2990mm (4:1 aspect ratio), area = >2.2m<sup>2</sup>, length dimension = 2001 - 3000mm, therefore 11mm seal depth should be applied.



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 NW9 7AA

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Large <b>CUIN</b> IGU's		
area (m <sup>2</sup> )	seal depth	sightline (mm ±2)
≤3.5	5,5	12
3.51 - 5	7	13.5
>5	9	15.5
length dimension (mm)	seal depth	sightline (mm ±2)
≤2500	5,5	12
2501 - 3500	7	13.5
>3500	9	15.5

Silicone sealed <b>CUIN</b> IGU's		
area (m <sup>2</sup> )	seal depth	sightline (mm ±2)
<3.5	7	13.5
3.51 - 5	9	15.5
>5	12	18.5
length dimension (mm)	seal depth	sightline (mm ±2)
>2500	7	13.5
2501 - 3500	9	15.5
>3500	12	18.5

- If a pane size falls into more than one section, the largest seal depth should be applied,
- Example – silicone sealed **CUIN** IGU, pane size 3000mm x 2000mm, area = >5m<sup>2</sup>, length dimension = 2501 - 3500mm, therefore 12mm seal depth should be applied.



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## Appearance and Visual Quality

### Scope

This technical note details all appropriate optical and visual quality factors for **CUIN** suspended film inside an insulating glass unit (IGU) that influence the appearance of the area that remains visible after installation. This technical note does not apply to any other component used to construct the IGU.

### Inspection

**CUIN** suspended film inside the IGU shall be viewed at 90 degrees to the glass surface from the room side, standing at a minimum distance of 3 metres from the inner glass surface. The assessment of the visual quality of the film should be carried out in diffuse daylight conditions (overcast sky) without direct sunlight or artificial lighting. It is not permissible to find defects at close range and then mark them so as to be visible from the given viewing distance. Visibility through the film i.e. the view of the background is generally the acceptable criterion, not the appearance in reflection.

### Area to be assessed

The area to be assessed is the entire vision area of the IGU with exception of a 50mm wide band around the edge of the vision area.

### Acceptance criteria

Optical defects such as smears, dirt or foreign particles on the film surface are unacceptable. This applies also to any such defect within the 50mm edge zone if they are visually disturbing.

	<u>Main Zone</u>	<u>Edge Zone</u>
<u>Scratches</u>	Max length 15mm	Max length 30mm
<u>Creases</u>	Not allowed	Extending no more than 10mm from spacer
<u>Waves</u>	Not allowed	Extending no more than 15mm from spacer

An equalisation hole in the film will be positioned in one corner of the IGU approximately 10mm from the spacer bar and 3mm in diameter.

When viewed in accordance with the stipulated inspection criteria, **CUIN** film will be deemed acceptable as long as no defects noticed that are visually disturbing or any defects noted comply with the acceptance limits prescribed above.