

Technical Information

ATS-139 2013-01-02

THERMAL STRESS FOR PILKINGTON GLAZING COMBINATIONS *INDEX*

PAGE	OUTER LIGHT	ROOM SIDE LIGHT
5.	Pilkington Optifloat [™] Clear Pilkington Optifloat [™] Clear Pilkington Optifloat [™] Clear	Pilkington Optifloat [™] Clear Pilkington Energy Advantage [™] #3 surface
6.	Pilkington Optifloat [™] Blue-Green or Bronze or Green Pilkington Optifloat [™] Blue-Green or Bronze or Green Pilkington Optifloat [™] Blue-Green or Bronze or Green	Pilkington Optifloat [™] Clear Pilkington Energy Advantage [™] #3 surface
7.	Pilkington Optifloat [™] Grey Pilkington Optifloat [™] Grey Pilkington Optifloat [™] Grey	Pilkington Optifloat [™] Clear Pilkington Energy Advantage [™] #3 surface
8.	Pilkington Arctic Blue [™] or EverGreen [™] Pilkington Arctic Blue [™] or EverGreen [™] Pilkington Arctic Blue [™] or EverGreen [™]	Pilkington Optifloat [™] Clear Pilkington Energy Advantage [™] #3 surface
9.	Pilkington SuperGrey [™] Pilkington SuperGrey [™] Pilkington SuperGrey [™]	Pilkington Optifloat [™] Clear Pilkington Energy Advantage [™] #3 surface
10.	Pilkington Eclipse Advantage [™] Blue-Green or Bronze Pilkington Eclipse Advantage [™] Blue-Green or Bronze Pilkington Eclipse Advantage [™] Blue-Green or Bronze	#2 Pilkington Optifloat ™ Clear
11.	Pilkington Eclipse Advantage [™] Grey #2 surface Pilkington Eclipse Advantage [™] Grey #2 surface Pilkington Eclipse Advantage [™] Grey #2 surface	Pilkington Optifloat [™] Clear Pilkington Energy Advantage [™] #3 surface

PAGE OUTER LIGHT

ROOM SIDE LIGHT

12.

Pilkington **Eclipse Advantage**™ Arctic Blue or EverGreen #2

Pilkington **Eclipse Advantage**™ Arctic Blue or EverGreen #2 Pilkington **Optifloat**™ Clear

Pilkington **Eclipse Advantage**™ Arctic Blue or EverGreen #2 Pilkington **Energy Advantage**™ #3 surface

13.

Pilkington **Eclipse Advantage**™ Clear #2 surface

Pilkington **Eclipse Advantage**™ Clear #2 surface Pilkington **Optifloat**™ Clear

Pilkington **Eclipse Advantage**™ Clear #2 surface Pilkington **Energy Advantage**™ #3 surface

14.

Pilkington **Eclipse**[™] Gold #2 surface

Pilkington **Eclipse**[™] Gold #2 surface Pilkington **Optifloat**[™] Clear

Pilkington **Eclipse**[™] Gold #2 surface Pilkington **Energy Advantage**[™] #3 surface

15.

Pilkington **Solar E**[™] Clear #2 surface

Pilkington **Solar E**[™] Clear #2 surface Pilkington **Optifloat**[™] Clear

Pilkington **Solar E**[™] Clear #2 surface Pilkington **Energy Advantage**[™] #3 surface

16.

Pilkington **Solar-E**[™] Arctic Blue #2 surface

Pilkington **Solar-E**[™] Arctic Blue #2 surface Pilkington **Optifloat**[™] Clear

Pilkington **Solar-E**[™] Arctic Blue #2 surface Pilkington **Energy Advantage** #3 surface

17.

Pilkington **Solar-E**[™] Blue-Green #2 surface

Pilkington **Solar-E**[™] Blue-Green #2 surface Pilkington **Optifloat**[™] Clear

Pilkington **Solar-E**[™] Blue-Green #2 surface Pilkington **Energy Advantage** #3 surface

18.

Pilkington **Solar-E**[™] Grey #2 surface

Pilkington **Solar-E**[™] Grey #2 surface Pilkington **Optifloat**[™] Clear

Pilkington **Solar-E**[™] Grey #2 surface Pilkington **Energy Advantage**[™] #3 surface

THERMAL STRESS FOR PILKINGTON GLASS COMBINATIONS INSTALLED IN U.S. AND CANADA

Summary

The thermal stress for various 1/4" (6mm) thick glass combinations is found, as a percentage of a nominal allowable annealed glass stress, from the following decision trees when the glass types, site location, shadow condition and frame color are known.

The branching trees give the glass stress for the worst environmental condition encountered in normal service conditions as a percentage of a nominal allowable stress level in annealed glass for clean-cut, undamaged edges. When the allowable stress limit is exceeded then that light should typically be heat treated (heat strengthened or tempered) to reduce the probability of breakage to a rate less than a nominal 8 in 1000.

Thermal stress calculations for these and other Pilkington single glazed glasses, or when they are used in combination in an insulating glass unit with many other glass manufacturers products, can be found by running the Thermal Stress Calculator program at: http://www.pilkingtoncalculators.com/tsc.php

Method

(1) Determine the glass type to be evaluated from the Index on pages 1 and 2, and the location type, shadow type and frame color from the following choices:

Location Types: "Coastal' includes the area from the sea coast to 100 miles inland and

below 3,000 ft. It does not include the U.S. Great Lakes shores.

"Inland" is over 100 miles from the sea coast and up to an altitude of 3,000 ft.

"*Mountains*" include altitudes above 3,000 ft.

Shadow Types: Shadows are classified as "*None*" (**N**), "*Mobile*" (**M**), or "*Permanent*" (**P**) according to the following table:

Horizontal Depth Vertical Mullions

Horizontal Overhang

1"	2"	3"	4"	2	20"	30" 4	0"
	N			М	Р	М	N
N	M	1			P		

Determine the most severe of the two shadow conditions, vertical or horizontal. ("Mobile" shadows cause more stress than "None", and "Permanent" shadows cause more stress than "Mobile" shadows).

The horizontal overhead shadows are based on locations between latitudes 20° and 50°.

Frames are made of aluminum and are either "Light" e.g. mill finish or clear anodized, or "Dark" color e.g. light bronze, or dark bronze.

(2) Proceed across the selected page from left to right, connecting the appropriate glass type, location type, shadow type, and frame color.

(3) Record the resulting percentage of nominal allowable stress for annealed glass.

Notes:

In all cases a conservative approach has been taken: It is assumed that light color blinds (Venetian or similar type) are used, in a lowered and closed position, with a 2" or greater gap between the blind slats and the facing glass.

Thermally broken frames are assumed.

It is assumed that the glass will be properly installed with undamaged, clean cut edges and with no unusual heat traps from insulating drapes, drop ceilings, etc.. HVAC air vents should be directed to blow away from the glass.

The added solar radiation by reflection at inside corners has not been considered in this simplified analysis.

Glass with damaged edges can have thermal fracture before the 100% stress limit is reached; while very high quality, polished edges can increase the allowable stress limit to 120% or more without breakage occurring.

The allowable annealed glass stress levels used in this bulletin are approximate. A stress level of 100% in this bulletin suggests that about 1 in 125 lights is at risk of breakage, while a higher thermal stress level of 200% suggests that about half of the stressed lights may break.

Architectural Technical Services can prepare similar sheets for other glass combinations upon request.

For more accuracy a set of drawings showing location, wall sections, frame type and color, building plan and elevations, and shadow patterns is needed to run an individual computer analysis of an individual project.

Example:

A double glazed sealed unit with second surface ¼" Pilkington **Eclipse Advantage**™ Bronze, #2 surface reflective, and a ¼" clear inboard light is installed in New York City in a light color frame which projects 3" from the face of the glass at all 4 edges.

Based on the given conditions of a coastal location, a "mobile" shadow from the head of the frame (the mullions give "no shadow"), and a light frame, the resulting stress levels are: 97% and 56%, for the outer and inner light, of the nominal allowable limit for annealed glass. These values for both lights are within the allowable limits for clean-cut, undamaged, annealed glass.

Changing the inner light to Pilkington **Energy Advantage**™ Low-E Glass changes the stress levels to 101% and 59%. This may require only the outer light to be heat treated.

Contact Pilkington North America, Inc. Architectural Technical Services, tel: 419 247 4448 for further information.

The information contained in this bulletin is offered for assistance in the application of Pilkington North America Inc. flat glass products, but **IT DOES NOT CONSTITUTE A WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** Actual performance may vary in particular applications

Page 5

Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details)

Glazing Location Shadow Frame

Glazing		Loc	cation	Shadow	Frame	
	nner Light			Color	Outer	Inner
SINGLE GLAZED		Coastal	None	Dark	35%	
1/4" Clear		Coastal	None	Light	37%	
		Coastal	Mobile	Dark	38%	
BLINDS::		Coastal	Mobile	Light	41%	
Light color Venetian		Coastal	Permanent	Dark	45%	
Closed		Coastal	Permanent	Light	48%	
		Inland	None	Dark	36%	
		Inland	None	Light	38%	
		Inland	Mobile	Dark	40%	
		Inland	Mobile	Light	43%	
		Inland	Permanent	Dark	47%	
		Inland	Permanent	Light	50%	
		Mountain	None	Dark	37%	
		Mountain	None	Light	40%	
		Mountain	Mobile	Dark	41%	
		Mountain	Mobile	Light	44%	
		Mountain	Permanent	Dark	49%	
		Mountain	Permanent	Light	52%	
DOUBLE GLAZED IG		Coastal	None	Dark	38%	43%
1/4" Clear	1/4" Clear	Coastal	None	Light	40%	46%
1/1 Clodi	1/ 1	Coastal	Mobile	Dark	42%	48%
BLINDS:		Coastal	Mobile	Light	45%	51%
Light color Venetian		Coastal	Permanent	Dark	49%	56%
Closed		Coastal	Permanent	Light	52%	60%
Closed				_		
		Inland	None	Dark	40%	46%
		Inland	None	Light	43%	49%
		Inland	Mobile	Dark	45%	51%
		Inland	Mobile	Light	48%	55%
		Inland	Permanent	Dark	53%	60%
		Inland	Permanent	Light	56%	64%
		Mountain	None	Dark	43%	49%
		Mountain	None	Light	46%	52%
		Mountain	Mobile	Dark	48%	55%
		Mountain	Mobile	Light	51%	58%
		Mountain	Permanent	Dark	56%	64%
		Mountain	Permanent	Light	60%	68%
DOUBLE GLAZED IG		Coactal	None	Dark	420/-	E00/-
	1/4" Pilkington	Coastal Coastal	None None	Light	42% 44%	50% 53%
		Coastal		-	44% 46%	55%
	-E Glass#3 surface	Coastal	Mobile Mobile	Dark Light	46% 49%	55% 59%
Light color Venetian	-L Glass#J Sullace	Coastal	Permanent	Dark	49% 54%	59% 65%
Closed		Coastal	Permanent	Light	54% 58%	69%
Gioseu		Coastai	i cillialielli	Ligit		
		Inland	None	Dark	45%	54%
		Inland	None	Light	48%	57%
		Inland	Mobile	Dark	50%	60%
		Inland	Mobile	Light	53%	64%
		Inland	Permanent	Dark Light	58%	70%
		Inland	Permanent	Light	62%	75%
		Mountain	None	Dark	48%	58%
		Mountain	None	Light	51%	62%
		Mountain	Mobile	Dark	53%	64%
		Mountain	Mobile	Light	57%	69%
			Б			
		Mountain	Permanent	Dark	62%	75%

Page 6	Percent of Annealed (Glass Nominal	Allowable St			
GLAZING		LOCATION	SHADOW	FRAME		
Outer Light	Inner Light			COLOR	Outer	Inner
SINGLE GLAZED		Coastal	None	Dark	60%	
6 mm Pilkington Optifloat ™		Coastal	None	Light	64%	
Blue-Green, Green or Bronze		Coastal	Mobile	Dark	66%	
BLINDS:		Coastal	Mobile	Light	71%	
Light Venetian		Coastal	Permanent	Dark	78%	
Closed		Coastal	Permanent	Light	83%	
		Inland	None	Dark	64%	
		Inland	None	Light	68%	
		Inland	Mobile	Dark	71%	
		Inland	Mobile	Light	76%	
		Inland	Permanent	Dark	83%	
		Inland	Permanent	Light	89%	
		Mountain	None	Dark	69%	
		Mountain	None	Light	73%	
		Mountain	Mobile	Dark	76%	
		Mountain	Mobile	Light	81%	
		Mountain	Permanent	Dark	89%	
		Mountain	Permanent	Light	95%	
DOUBLE GLAZED IG		Coastal	None	Dark	71%	55%
6 mm Pilkington Optifloat ™	6 mm Clear	Coastal	None	Light	75%	59%
Blue-Green, Green or Bronze	5 mm 5.5a.	Coastal	Mobile	Dark	78%	62%
BLINDS		Coastal	Mobile	Light	84%	66%
Light Venetian		Coastal	Permanent	Dark	92%	72%
Closed		Coastal	Permanent	Light	98%	77%
					770/	500/
		Inland	None	Dark	77%	60%
		Inland	None	Light	82%	64%
		Inland	Mobile	Dark	86%	67%
		Inland	Mobile	Light	91%	71%
		Inland	Permanent	Dark	100%	78%
		Inland	Permanent	Light	<i>107%</i>	83%
		Mountain	None	Dark	84%	65%
		Mountain	None	Light	90%	69%
		Mountain	Mobile	Dark	93%	72%
		Mountain	Mobile	Light	100%	76%
		Mountain	Permanent	Dark	<i>109%</i>	84%
		Mountain	Permanent	Light	117%	89%
DOUBLE GLAZED IG		Coastal	None	Dark	79%	53%
6 mm Pilkington Optifloat ™	1/4" Pilkington	Coastal	None	Light	84%	56%
Blue-Green, Green or Bronze	Energy Advantage™	Coastal	Mobile	Dark	87%	59%
BLINDS	Low-E Glass #3 surface	Coastal	Mobile	Light	93%	63%
Light Venetian	2011 2 01400 11 0 0411400	Coastal	Permanent	Dark	102%	69%
Closed		Coastal	Permanent	Light	109%	73%
		Inland	None	Dark	86%	57%
		Inland	None	Light	92%	61%
		Inland	Mobile	Dark	96%	63%
		Inland	Mobile	Light	90% 102%	68%
		Inland	Permanent	Dark	112%	74%
		Inland	Permanent	Light	112% 119%	7 4 % 79%
			Nov-			
		Mountain	None	Dark	94%	62%
		Mountain	None	Light	100%	66%
		Mountain	Mobile	Dark	104%	68%
		Mountain	Mobile	Light	111%	73%
		Mountain	Permanent	Dark	122%	80%
		Mountain	Permanent	Light	<i>130%</i>	85%

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Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details)

Glazing Location Shadow Frame

Glazing	Location	Shadow	Frame		
Outer Light Inner Light	t		Color	Outer	Inner
SINGLE GLAZED	Coastal	None	Dark	63%	
1/4" Pilkington Optifloat™ Grey	Coastal	None	Light	67%	
, 33. 34. 34.	Coastal	Mobile	Dark	70%	
BLINDS::	Coastal	Mobile	Light	74%	
Light color Venetian	Coastal	Permanent	Dark	81%	
Closed	Coastal	Permanent	Light	87%	
5,555	oodota.		gc	C 7.70	
	Inland	None	Dark	67%	
	Inland	None	Light	72%	
	Inland	Mobile	Dark	75%	
	Inland	Mobile	Light	80%	
	Inland	Permanent	Dark	88%	
	Inland	Permanent	Light	94%	
	Inana	remanent	Ligite	3170	
	Mountain	None	Dark	72%	
	Mountain	None	Light	77%	
	Mountain	Mobile	Dark	80%	
	Mountain	Mobile	Light	86%	
	Mountain	Permanent	Dark	94%	
	Mountain	Permanent	Light	100%	
	Trodricant	T CITICITE	Ligite	200 70	
DOUBLE GLAZED IG	Coastal	None	Dark	74%	57%
1/4" Pilkington Optifloat™ Grey 1/4" Clear	Coastal	None	Light	79%	61%
17 1 mangeon openious orey 17 1 clear	Coastal	Mobile	Dark	82%	63%
BLINDS:	Coastal	Mobile	Light	88%	67%
Light color Venetian	Coastal	Permanent	Dark	97%	74%
Closed	Coastal	Permanent	Light	103%	79%
C.03Cd	Coastai	remanent	Ligite	105 /0	7 5 70
	Inland	None	Dark	81%	61%
	Inland	None	Light	87%	65%
	Inland	Mobile	Dark	90%	68%
	Inland	Mobile	Light	96%	73%
	Inland	Permanent	Dark	<i>106%</i>	80%
	Inland	Permanent	Light	113%	85%
	Imana	remanent	Ligite	115 /6	0570
	Mountain	None	Dark	89%	66%
	Mountain	None	Light	95%	71%
	Mountain	Mobile	Dark	99%	73%
	Mountain	Mobile	Light	<i>105%</i>	78%
	Mountain	Permanent	Dark	115%	86%
	Mountain	Permanent	Light	123%	92%
	Piodritairi	1 Cilitaticit	Ligiti	125 /6	JZ 70
DOUBLE GLAZED IG	Coastal	None	Dark	83%	53%
1/4" Pilkington Optifloat ™ Grey 1/4" Pilkington		None	Light	89%	56%
Energy Advantage		Mobile	Dark	92%	59%
BLINDS: Low-E Glass#3 su		Mobile	Light	98%	63%
Light color Venetian	Coastal	Permanent	Dark	108%	69%
Closed	Coastal	Permanent	Light	115%	73%
Giosca	Coastai	. Cimanett	LIGHT	11370	7570
	Inland	None	Dark	91%	57%
	Inland	None	Light	97%	61%
	Inland	Mobile	Dark	101%	64%
	Inland	Mobile	Light	108%	68%
	Inland	Permanent	Dark	118%	74%
	Inland	Permanent	Light	126%	79%
	Mountain	None	Dark	99%	62%
	Mountain	None	Light	<i>106%</i>	66%
	Mountain	Mobile	Dark	<i>110%</i>	68%
	Mountain	Mobile	Light	118%	73%
	Mountain	Permanent	Dark	129%	80%

Page 8

Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details) Glazing Location Shadow Frame

Outer LightInner LightColorOuterSINGLE GLAZEDCoastalNoneDark68%1/4" Pilkington Arctic Blue™CoastalNoneLight72%or 1/4" Pilkington EverGreen™CoastalMobileDark75%BLINDS::CoastalMobileLight80%Light color VenetianCoastalPermanentDark88%	
SINGLE GLAZEDCoastalNoneDark68%1/4" Pilkington Arctic Blue™CoastalNoneLight72%or 1/4" Pilkington EverGreen™CoastalMobileDark75%BLINDS::CoastalMobileLight80%Light color VenetianCoastalPermanentDark88%	
1/4" Pilkington Arctic Blue™ or 1/4" Pilkington EverGreen™Coastal CoastalNone MobileLight Dark75% 75%BLINDS:: Light color VenetianCoastal CoastalMobile PermanentLight Dark80% 88%	
or 1/4" Pilkington EverGreen ™ Coastal Mobile Dark 75% BLINDS:: Coastal Mobile Light 80% Light color Venetian Coastal Permanent Dark 88%	
BLINDS:: Coastal Mobile Light 80% Light color Venetian Coastal Permanent Dark 88%	
Light color Venetian Coastal Permanent Dark 88%	
Closed Coastal Permanent Light 94%	
Cosca Termanent Light 3470	
7.1.1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.	
Inland None Dark 73%	
Inland None Light 78%	
Inland Mobile Dark 81%	
Inland Mobile Light 87%	
Inland Permanent Dark 95%	
Inland Permanent Light 102 9	0
Mountain None Dark 79%	
Mountain None Light 84%	
Mountain Mobile Dark 88%	
Mountain Permanent Dark 103 9	
Mountain Permanent Light 1099	6
·	
DOUBLE GLAZED IG Coastal None Dark 81%	59%
or 1/4" Pilkington EverGreen ™ Coastal Mobile Dark 90%	
BLINDS: Coastal Mobile Light 96%	70%
Light color Venetian Coastal Permanent Dark 1059	6 77%
Closed Coastal Permanent Light 1129	-
Costa Femaleit Light	0270
	C 40/
Inland None Dark 89%	
Inland None Light 95%	68%
Inland Mobile Dark 99%	71%
Inland Mobile Light 1059	
Inland Permanent Light 1239	6 89%
Mountain None Dark 97%	69%
Mountain None Light 1039	
Mountain Mobile Light 1159	
Mountain Permanent Dark 126 9	6 90%
Mountain Permanent Light 1349	6 96%
DOUBLE CLATED TO	
DOUBLE GLAZED IG Coastal None Dark 90%	
1/4" Pilkington Arctic Blue™ 1/4" Pilkington Coastal None Light 96%	57%
or 1/4" Pilkington EverGreen™ Energy Advantage™ Coastal Mobile Dark 100 9	6 59%
BLINDS: Low-E Glass#3 surface Coastal Mobile Light 1079	6 63%
Light color Venetian Coastal Permanent Dark 1179	
Closed Coastal Permanent Light 1259	6 74%
Inland None Dark 99%	58%
Inland None Light 106 9	6 61%
Inland Mobile Dark 1109	
Inland Mobile Light 1179	
Inland Damasant Ded. 4000	
Inland Permanent Dark 129 9	6 80%
Inland Permanent Dark 1299 Inland Permanent Light 1389	
Inland Permanent Light 138 9	6 62%
Inland Permanent Light 138 9 Mountain None Dark 108 9	
Inland Permanent Light 138 9 Mountain None Dark 108 9 Mountain None Light 116 9	6 66%
Inland Permanent Light 1389 Mountain None Dark 1089 Mountain None Light 1169 Mountain Mobile Dark 1209	66% 66%
Inland Permanent Light 1389 Mountain None Dark 1089 Mountain None Light 1169	66% 66%
Inland Permanent Light 1389 Mountain None Dark 1089 Mountain None Light 1169 Mountain Mobile Dark 1209 Mountain Mobile Light 1289	66% 666% 674%
Inland Permanent Light 1389 Mountain None Dark 1089 Mountain None Light 1169 Mountain Mobile Dark 1209 Mountain Mobile Light 1289	6 66% 6 69% 6 74% 6 81%

Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details) Glazing Location Shadow I

Glazin	g		Location	Shadow		Frame
Outer Light	Inner Light			Color	Outer	Inner
SINGLE GLAZED		Coastal	None	Dark	89%	
1/4" Pilkington SuperGrey ™		Coastal	None	Light	95%	
17 Timmington Super Croy		Coastal	Mobile	Dark	99%	
BLINDS::		Coastal	Mobile	Light	106%	
Light color Venetian		Coastal	Permanent		116%	
Closed		Coastal	Permanent		124%	
Closed		Coastai	Permanent	Ligit	12470	
		Inland	None	Dark	97%	
		Inland	None	Light	104%	
		Inland	Mobile	Dark	108%	
		Inland	Mobile	Light	115%	
		Inland	Permanent	•	126%	
		Inland	Permanent		135%	
		2		gc		
		Mountain	None	Dark	<i>105%</i>	
		Mountain	None	Light	112%	
		Mountain	Mobile	Dark	117%	
		Mountain	Mobile	Light	<i>125%</i>	
		Mountain	Permanent		<i>137%</i>	
		Mountain	Permanent		146%	
DOUBLE GLAZED IG		Coastal	None	Dark	107%	68%
1/4" Pilkington SuperGrey ™	1/4" Clear	Coastal	None	Light	114%	73%
	•	Coastal	Mobile	Dark	119%	76%
BLINDS:		Coastal	Mobile	Light	127%	81%
Light color Venetian		Coastal	Permanent		139%	89%
Closed		Coastal	Permanent		148%	95%
5.5554		oodota.		gc	, .	2070
		Inland	None	Dark	118%	74%
		Inland	None	Light	<i>126%</i>	79%
		Inland	Mobile	Dark	<i>131%</i>	83%
		Inland	Mobile	Light	<i>140%</i>	88%
		Inland	Permanent		<i>153%</i>	97%
		Inland	Permanent	Light	164%	103%
		Mountain	None	Dark	<i>129%</i>	81%
		Mountain	None	Light	<i>138%</i>	86%
		Mountain	Mobile	Dark	144%	90%
		Mountain	Mobile	Light	<i>153%</i>	96%
		Mountain	Permanent	Dark	<i>168%</i>	105%
		Mountain	Permanent	Light	<i>179%</i>	112%
DOUBLE GLAZED IG		Coastal	None	Dark	118%	54%
1/4" Pilkington SuperGrey™	1/4" Pilkington	Coastal	None	Light	<i>126%</i>	58%
	Energy Advantage™	Coastal	Mobile	Dark	<i>131%</i>	60%
BLINDS:	Low-E Glass#3 surface	Coastal	Mobile	Light	<i>140%</i>	64%
Light color Venetian		Coastal	Permanent	Dark	<i>154%</i>	71%
Closed		Coastal	Permanent	Light	<i>164%</i>	75%
		Inland	None	Dark	131%	59%
		Inland	None	Light	140%	63%
		Inland	Mobile	Dark	145%	65%
			Mobile	Light	<i>155%</i>	70%
		Inland				
		Inland	Permanent	Dark	<i>170%</i>	77%
				Dark		77% 82%
		Inland Inland	Permanent Permanent	Dark Light	170% 181%	82%
		Inland Inland Mountain	Permanent Permanent None	Dark Light Dark	170% 181% 144%	82% 64%
		Inland Inland Mountain Mountain	Permanent Permanent None None	Dark Light Dark Light	170% 181% 144% 153%	82% 64% 68%
		Inland Inland Mountain Mountain Mountain	Permanent Permanent None None Mobile	Dark Light Dark Light Dark	170% 181% 144% 153% 159%	82% 64% 68% 71%
		Inland Inland Mountain Mountain Mountain Mountain	Permanent Permanent None None Mobile Mobile	Dark Light Dark Light Dark Light	170% 181% 144% 153% 159% 170%	82% 64% 68% 71% 75%
		Inland Inland Mountain Mountain Mountain	Permanent Permanent None None Mobile	Dark Light Dark Light Dark Light Dark	170% 181% 144% 153% 159%	82% 64% 68% 71%

Page 10 Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details) Glazing Location Shadow Frame **Outer Light Inner Light** Color **Outer Inner** SINGLE GLAZED Coastal None Dark 79% 1/4" Pilkington **Eclipse Advantage™** #2 84% Light Coastal None Blue-Green or Bronze 87% Coastal Mobile Dark 93% BLINDS:: Coastal Mobile Light *102%* Light color Venetian Coastal Permanent Dark *109%* Closed Coastal Permanent Light 85% Inland Dark None Inland None Light 91% Inland Mobile Dark 94% Inland Mobile Light *101%* Inland Permanent Dark 111% Inland Permanent Light *118%* 92% Mountain None Dark Mountain None Light 98% Mountain Mobile Dark *102%* Mountain Mobile Light 109% Mountain Permanent Dark 119% Permanent Mountain Light *127%* **DOUBLE GLAZED IG** Dark 82% 47% Coastal None 1/4" Pilkington 50% **Eclipse Advantage™** #2 1/4" Clear Coastal Light 87% None 91% 52% Blue-Green or Bronze Coastal Mobile Dark **BLINDS:** Coastal Mobile Light 97% 56% Light color Venetian Coastal Permanent Dark 107% 61% Closed Coastal Permanent Light 114% 65% 90% 51% Inland None Dark 96% 54% Inland None Light 56% Inland Mobile Dark 100% Light *106%* 60% Inland Mobile Inland Permanent Dark 117% 66% Inland Permanent Light 125% 70% Mountain None Dark 98% 54% Mountain None Light *105%* 58% Mountain Mobile 109% 60% Dark Mountain Mobile Light 116% 64% Mountain Permanent Dark *128%* 71% Mountain Permanent Light *136%* 75% **DOUBLE GLAZED IG** 50% Coastal None Dark 85% 1/4" Pilkington 1/4" Pilkington **Eclipse Advantage™** #2 91% 53% None Light Coastal Blue-Green or Bronze **Energy Advantage™** Coastal Mobile Dark 94% 55% **BLINDS:** Low-E Glass#3 surface Coastal Mobile Light *101%* 59% 64% Light color Venetian Coastal 110% Permanent Dark 69% Closed Coastal Permanent Light 118% 54% 93% Inland None Dark Inland None Light 99% 57% Inland Mobile Dark 103% 59% Inland 110% 63% Mobile Light Inland Permanent Dark 121% 70% Inland Permanent Light 129% 74% Mountain Dark 102% 58% None Mountain None Light *109%* 61% Mountain Mobile Dark 113% 64%

Mountain

Mountain

Mountain

Mobile

Permanent

Permanent

120%

132%

141%

Light

Dark

Light

68%

75%

80%

Page 11 Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details) Location **Shadow** Glazing Frame **Outer Light Inner Light** Color Outer Inner SINGLE GLAZED Coastal None Dark 86% 1/4" Pilkington Eclipse Advantage™ #2 Grey Coastal None Light 92% 96% Coastal Mobile Dark Mobile *102%* BLINDS:: Coastal Light Light color Venetian Coastal Permanent Dark 112% Closed Coastal Permanent Light 119% Inland None Dark 94% Inland Light 100% None *104%* Inland Mobile Dark Inland Mobile Light 111% Inland Permanent Dark 122% Inland Permanent Light 130% Mountain None Dark 101% Mountain None Light 108% Mountain Mobile Dark 112% Mobile Light 120% Mountain Mountain Permanent Dark 132% Mountain Permanent Light 140% 90% **DOUBLE GLAZED IG** None Dark 49% Coastal 1/4" Pilkington Eclipse Advantage™ #2 Grey 1/4" Clear Coastal None Light 97% 52% Coastal Mobile 100% 54% Dark 107% 58% **BLINDS:** Coastal Mobile Light Light color Venetian Coastal Permanent Dark 118% 63% 125% 67% Closed Coastal Permanent Light Inland None Dark 99% 52% Inland None Light 106% 56% *110%* 58% Inland Mobile Dark Inland Mobile Light 118% 62% 129% 68% Inland Permanent Dark *138%* Inland Permanent Light 73% 109% 56% Mountain Dark None Mountain None Light 116% 60% Mountain Mobile Dark 121% 63% *129%* Mountain Mobile Light 67% Mountain Permanent Dark 141% 73% Mountain Permanent Light *151%* 78% **DOUBLE GLAZED IG** 93% 50% Coastal None Dark 1/4" Pilkington 1/4" Pilkington Coastal None Light 100% 54% **Energy Advantage™** Eclipse Advantage™ #2 Grey Coastal Mobile Dark 104% 56% BLINDS: Low-E Glass#3 surface Coastal Mobile Light 111% 60% Light color Venetian *121%* 65% Coastal Permanent Dark Closed Coastal Permanent Light 130% 70% Inland *103%* 54% None Dark Inland None Light 110% 58% 60% Inland Mobile Dark 114% 122% 64% Inland Mobile Light Inland Permanent 134% 71% Dark Inland Permanent Light 142% 75% Mountain None Dark 112% 59% Mountain None Light 120% 63% Mobile Mountain *125%* 65% Dark Mountain Mobile Light *133%* 69% 76% Mountain Permanent Dark *146%* Mountain Permanent Light **156%** 81%

Page 12	Percent of Nomin	al Allowable Stre	ess for Anı	nealed Glass (See	Notes on p	.4 for deta	ails)
	Glazing	L	ocation	Shadow	Frame		
Outer Light		r Light			Color	Outer	Inner
SINGLE GLAZED			Coastal	None	Dark	91%	
1/4" Eclipse Advantage			Coastal	None	Light	98%	
Arctic Blue or EverGre	een		Coastal	Mobile	Dark	<i>102%</i>	
BLINDS::			Coastal	Mobile	Light	<i>108%</i>	
Light color Venetian			Coastal	Permanent	Dark	119%	
Closed			Coastal	Permanent	Light	<i>127%</i>	
			Inland	None	Dark	100%	
			Inland	None	Light	<i>106%</i>	
			Inland	Mobile	Dark	110%	
			Inland	Mobile	Light	118%	
			Inland	Permanent	Dark	129%	
			Inland	Permanent	Light	<i>138%</i>	
			Mountain	None	Dark	108%	
			Mountain	None	Light	115%	
			Mountain	Mobile	Dark	<i>120%</i>	
			Mountain	Mobile	Light	128%	
			Mountain	Permanent	Dark	140%	
			Mountain	Permanent	Light	150%	
DOUBLE GLAZED	IG		Coastal	None	Dark	96%	50%
1/4" Pilkington Eclipse Advantage ^T	M #) 1	./4" Clear	Coastal	None	Light	103%	53%
		./4 Clear		Mobile			
Arctic Blue or EverGr	een		Coastal		Dark	107%	55%
BLINDS:			Coastal	Mobile	Light	114%	59%
Light color Venetian			Coastal	Permanent	Dark	125%	64%
Closed			Coastal	Permanent	Light	134%	69%
			Inland	None	Dark	<i>106%</i>	54%
			Inland	None	Light	113%	57%
			Inland	Mobile	Dark	118%	59%
			Inland	Mobile	Light	<i>126%</i>	63%
			Inland	Permanent	Dark	<i>138%</i>	70%
			Inland	Permanent	Light	<i>147%</i>	74%
			Mountain	None	Dark	116%	58%
			Mountain	None	Light	124%	61%
			Mountain	Mobile	Dark	129%	64%
			Mountain	Mobile	Light	137%	68%
			Mountain	Permanent	Dark	151%	75%
			Mountain	Permanent	Light	161%	80%
			Tioditalii	remanene	Ligite		
DOUBLE GLAZED 1/4" Pilkington		" Pilkington	Coastal	None	Dark	99%	51%
Eclipse Advantage ^T			Coastal	None	Light	106%	54%
Arctic Blue or EverGr		#3 surface	Coastal	Mobile	Dark	110%	56%
BLINDS:	COV L		Coastal	Mobile	Light	117%	60%
Light color Venetian			Coastal	Permanent	Dark	129%	66%
Closed			Coastal	Permanent	Light	138%	70%
			Inland	None	Dark	109%	55%
			Inland	None	Light	116%	58%
			Inland	Mobile	Dark	121%	61%
			Inland	Mobile	Light	121% 129%	65%
			Inland	Permanent	Dark	142%	71%
			Inland	Permanent	Light	142% 151%	76%
					_		
			Mountain	None None	Dark Light	120%	59% 63%
			Mountain	None Mobile	Light	127%	
			Mountain		Dark	133%	65%
			Mountain	Mobile	Light	142%	70%
			Mountain	Permanent	Dark	155%	76%
			Mountain	Permanent	Light	166%	82%

Page 13 Percent of Nominal Allowable Stress for Annealed Glass (See Notes on p.4 for details) Glazing Location Shadow **Frame Outer Light Inner Light** Color Outer Inner SINGLE GLAZED Coastal None Dark 50% 1/4" Pilkington **Eclipse Advantage™** #2 53% Coastal None Light 55% Clear Coastal Mobile Dark BLINDS:: Coastal Mobile Light 59% 64% Light color Venetian Coastal Permanent Dark Closed 69% Coastal Permanent Light Inland None Dark 52% 56% Inland None Light Inland Mobile Dark 58% 62% Inland Mobile Light 68% Inland Permanent Dark Inland Permanent Light 73% Mountain Dark 55% None Mountain None Light 59% Mobile 62% Mountain Dark Mountain Mobile Light 66% Mountain Permanent Dark 72% Mountain Permanent Light 77% **DOUBLE GLAZED IG** Coastal None Dark 49% 40% 1/4" Pilkington **Eclipse Advantage™** 1/4" Clear 43% Coastal Light 52% None 54% 45% Clear #2 Coastal Mobile Dark **BLINDS:** Coastal Mobile Light 58% 48% 52% Light color Venetian Coastal Permanent Dark 64% Closed Coastal Permanent Light 68% 56% 53% 43% Inland Dark None Inland None Light 56% 46% Inland Mobile Dark 59% 48% Inland Mobile Light 63% 51% 69% 56% Inland Permanent Dark Inland Permanent Light 73% 60% 46% Mountain None Dark 57% Mountain None Light 61% 49% Mountain Mobile 63% 51% Dark 54% Mountain Mobile Light 67% Mountain Permanent Dark 74% 60% 79% 64% Mountain Permanent Light **DOUBLE GLAZED IG** Coastal None Dark 51% 46% 1/4" Pilkington 1/4" Pilkington **Eclipse Advantage™ Energy Advantage™** 49% Light 55% Coastal None Low-E #3 surface 51% Clear #2 Coastal Mobile Dark 57% **BLINDS:** Coastal Mobile Light 61% 55% 67% 60% Light color Venetian Coastal Permanent Dark Closed 71% 64% Coastal Permanent Light 50% Inland Dark 56% None 59% 53% Inland None Light Inland Mobile Dark 62% 55% Inland Mobile Light 66% 59% Inland Permanent 72% 65% Dark Inland Permanent Light 77% 69% 60% 53% Mountain None Dark Mountain None Light 64% 57% 59% Mountain Mobile Dark 67% 71% Mountain Mobile Light 63% Mountain Permanent Dark 78% 70% Permanent 83% 74% Mountain Light

Cotter Light SINGLE GLAZED SINGLE GLAZED Coastal None Light 45% 50% Coastal Mobile Light 53% Coastal Mobile Light 53% Coastal Mobile Light 53% Coastal Permanent Light 53% Coastal Coastal Permanent Light 53% Coastal Coastal None Light 53% Coastal	Page 14	Percent of Annealed G	lass Nominal A	Allowable Sti	ress		
Coastal None	GLAZING		LOCATION	SHADOW	FRAME		
Sem Pilkington Eclipse Gold #2 Coastal None Light 43% Sol Dark 50% Sol Coastal Mobile Light 53% Sol Coastal Mobile Light 53% Sol Coastal Permanent Light 63% Sol Coastal Permanent Light 63% Sol Coastal Permanent Light 63% Sol Coastal Permanent Light Coastal Permanent Light Coastal Permanent Light Coastal Light Coastal Permanent Light Coastal Light Coastal Light Coastal Permanent Light Coastal Light	Outer Light	Inner Light			COLOR	Outer	Inner
BLINDS: Coastal Mobile Dark 59% Coastal Permanent Light 53% Coastal Permanent Dark 59% Coastal Permanent Dark 59% Coastal Permanent Dark 59% Coastal Permanent Dark 69% Coastal Permanent Dark Coastal Coastal Permanent Dark Coastal Coastal Permanent Dark Coastal Coastal Coastal Coastal Permanent Dark Coastal			Coastal	None	Dark	45%	
BLINDS: Coastal Mobile Dark 59% Coastal Permanent Light 53% Coastal Permanent Dark 59% Coastal Permanent Dark 59% Coastal Permanent Dark 59% Coastal Permanent Dark 69% Coastal Permanent Dark Coastal Coastal Permanent Dark Coastal Coastal Permanent Dark Coastal Coastal Coastal Coastal Permanent Dark Coastal	6 mm Pilkington Eclipse™ Gold #2		Coastal	None	Light	48%	
Mobile Light Venetian Coastal Permanent Dark 59% 59% 1					-		
Light Venetian Coastal Permanent Light 59% 63%	BLINDS:						
Coastal Permanent Light 63% Final Light 14%	•						
Inland None Light 51% Inland Mobile Dark 53% Inland Mobile Dark 53% Inland Mobile Light 57% Inland Mobile Light 57% Inland Permanent Light 66% Mountain None Light 54% Mountain Mobile Light 56% Mountain Permanent Light 70% Mountain Permanent Light 70% Mountain Permanent Light 70% Mountain Mobile Light 59% 53% Mountain Mobile Light 57% 51% Mountain Mobile Light 64% 55% Mountain Mobile Light 55% 55% Mountain Mobile Light 64% 55% Mountain Mobile Light 64% 55% Mountain Mobile Light 65% 57% Mountain Mobile Light 64% 57% Mountain Mob							
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Inland							
Inland					_		
Inland							
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Mountain Mobile Light 54% 56% Mountain Mobile Light 60% 60% 14% 60% Mountain Mobile Light 60% 60% 14% 60%			Mountain	None	Dark	51%	
Mountain Mobile Dark 56% Mountain Mobile Light 60% Fermanent Light 60% Fermanent Light 60% Fermanent Light 70% 70							
Mountain Mobile Light 60% Fermanent Light 70%							
Mountain Permanent Light 70%							
None Down Down Dark Sow 44%					_		
DOUBLE GLAZED IG 6 mm Clear Coastal None Light 53% 47% 4							
6 mm Pilkington Eclipse™ Gold #2 6 mm Clear Coastal Mobile Dark 55% 49% (Coastal Mobile Light 59% 53% 81/10S:			Mountain	Permanent	Light	/0%	
6 mm Pilkington Eclipse™ Gold #2 6 mm Clear Coastal Mobile Dark 55% 49% (Coastal Mobile Light 59% 53% 81/10S:	DOUBLE CLAZED TO		Coactal	None	Dark	500/-	4/10/-
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BLINDS: Coastal Permanent Light 65% 58% 52% 62%							
Coastal Permanent Light 69% 62%					_		
Double Glazed	· ·						
Inland None Dark 54% 48% 1 1 1 1 1 1 1 1 1	•		Coastal	Permanent	Light	69%	62%
Inland None Light 57% 51% 17% 17% 56% 17%			Inland	None	Dark	54%	48%
Inland Mobile Dark 60% 53% 53% 1 1 1 1 1 1 1 1 1							
Inland Permanent Dark 70% 62% 66% 66% Mountain None Dark 55% 65% 66% Mountain None Dark 55% 65% 56% Mountain None Dark 55% 65% 56% Mountain Mobile Light 62% 54% Mountain Mobile Light 62% 54% Mountain Permanent Light 81% 70% 66% 66% Mountain None Light 59% 48% Coastal None Light 59% 48% 61% 50% 61% 61% 61% 61% 61% 61% 61% 61% 61% 61					_		
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Inland Permanent Light 75% 66%							
Mountain None Light 62% 54%							
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Mountain Mobile Light 69% 60% 60% Mountain Permanent Dark 76% 66% 66% Mountain Permanent Light 81% 70% 10% 10% 10% 10% 10% 10% 10% 10% 10% 1							
Mountain Mobile Light 69% 60% 66% Nountain Mountain Permanent Light 81% 70% 66% 66% Permanent Light 81% 70% 66% 66% Permanent Light 81% 70% 70% 70% 70% 70% 70% 70% 70% 70% 70							
Mountain Permanent Dark 76% 66% 66%							
DOUBLE GLAZED IG 6 mm Pilkington Eclipse™ Gold #2 BLINDS: Light Venetian Closed Inland None Light None Light Fermanent Light S9% 48% Coastal Mobile Light 65% 53% Coastal Permanent Dark 71% 58% Coastal Permanent Light 76% 62% Inland None Light 66% 54% Inland None Light 66% 54% Inland Mobile Light 76% 63% Inland None Light 77% 63% Fermanent None Light 77% 61%					_		
DOUBLE GLAZED IG 6 mm Pilkington Eclipse™ Gold #2 BLINDS: Light Venetian Closed Coastal None Light 59% 48%							
6 mm Pilkington Eclipse™ Gold #2 Energy Advantage™ Coastal Mobile Dark 61% 50% Elight Venetian Closed Low-E #3 surface Coastal Mobile Light 65% 53% Coastal Permanent Dark 71% 58% Coastal Permanent Light 76% 62% Inland None Light 64% 52% Inland Mobile Dark 66% 54% Inland Mobile Light 70% 57% Inland Permanent Dark 77% 63% Inland Permanent Light 83% 67% Mountain None Dark 64% 52% Mountain None Light 69% 55% Mountain Mobile Dark 71% 57% Mountain Mobile Light 76% 61%			Mountain	Permanent	Ligit	01%	70%
6 mm Pilkington Eclipse™ Gold #2 Energy Advantage™ Coastal Mobile Dark 61% 50% Elight Venetian Closed Low-E #3 surface Coastal Mobile Light 65% 53% Coastal Permanent Dark 71% 58% Coastal Permanent Light 76% 62% Inland None Light 64% 52% Inland Mobile Dark 66% 54% Inland Mobile Light 70% 57% Inland Permanent Dark 77% 63% Inland Permanent Light 83% 67% Mountain None Dark 64% 52% Mountain None Light 69% 55% Mountain Mobile Dark 71% 57% Mountain Mobile Light 76% 61%	DOUBLE GI AZFD IG		Coastal	None	Dark	55%	45%
Energy Advantage™ Low-E #3 surface Coastal Mobile Light 65% 53% Coastal Permanent Dark 71% 58% Coastal Permanent Light 76% 62% Inland None Dark 66% 52% Inland Mobile Light 70% 57% Inland Mobile Light 70% 57% Inland Permanent Dark 77% 63% Inland Permanent Dark 84% 67%		6mm Pilkington					
BLINDS: Light Venetian Closed Low-E #3 surface Coastal Coastal Permanent Coastal Permanent Light Formation Formation Coastal Permanent Light Formation Coastal Permanent Light Formation Fo	5 Timington Lonpoc Gold #2						
Light Venetian Closed Coastal Permanent Coastal Permanent Light 76% 62% Inland None Light 64% 52% Inland Mobile Dark 66% 54% Inland Mobile Light 77% 63% Inland Permanent Dark 84% 67%	BI INDS:						
Closed Coastal Permanent Light 76% 62% Inland None Dark 60% 48% Inland None Light 64% 52% Inland Mobile Dark 66% 54% Inland Mobile Light 70% 57% Inland Permanent Dark 77% 63% Inland Permanent Light 83% 67% Mountain None Dark 64% 52% Mountain None Light 69% 55% Mountain Mobile Dark 71% 57% Mountain Mobile Light 76% 61% Mountain Mobile Light 76% 61% Mountain Permanent Dark 84% 67%		LOW E #3 Surface					
Inland None Dark 60% 48% Inland None Light 64% 52% Inland Mobile Dark 66% 54% Inland Mobile Light 70% 57% Inland Permanent Dark 77% 63% Inland Permanent Light 83% 67% Mountain None Dark 64% 52% Mountain None Light 69% 55% Mountain Mobile Dark 71% 57% Mountain Mobile Dark 71% 57% Mountain Mobile Light 76% 61% Mountain Permanent Dark 84% 67%	•						
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Inland Mobile Dark 66% 54% Inland Mobile Light 70% 57% Inland Permanent Dark 77% 63% Inland Permanent Light 83% 67% Mountain None Dark 64% 52% Mountain None Light 69% 55% Mountain Mobile Dark 71% 57% Mountain Mobile Light 76% 61% Mountain Permanent Dark 84% 67%							
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Mountain Permanent Dark 84% 67%			Mountain		Dark		
			Mountain	Mobile	Light	76%	61%
			Mountain	Permanent	Dark	84%	67%
			Mountain	<u>Permanent</u>	Light	89%	

Page 15				Stress for A		
	azing	L	ocation	Shadow		Frame
Outer Light	Inner Light			Color	Outer	Inner
SINGLE GLAZED		Coastal	None	Dark	71%	
1/4" Pilkington Solar-E™ Clear #	[‡] 2	Coastal	None	Light	76%	
		Coastal	Mobile	Dark	79%	
BLINDS::		Coastal	Mobile	Light	84%	
Light color Venetian		Coastal	Permanent	Dark	92%	
Closed		Coastal	Permanent	Light	98%	
				5 1	760/	
		Inland	None	Dark	76%	
		Inland	None	Light	82%	
		Inland	Mobile	Dark	85%	
		Inland Inland	Mobile	Light	91% 99%	
		Inland	Permanent Permanent	Dark Light	106%	
		IIIIaiiu	reillallelli	Light	100%	
		Mountain	None	Dark	82%	
		Mountain	None	Light	88%	
		Mountain	Mobile	Dark	91%	
		Mountain	Mobile	Light	97%	
		Mountain	Permanent	Dark	<i>107%</i>	
		Mountain	Permanent	Light	114%	
DOUBLE GLAZED IG		Coastal	None	Dark	74%	46%
1/4" Pilkington Solar-E™ Clear #	‡2 1/4" Clear	Coastal	None	Light	79%	50%
		Coastal	Mobile	Dark	82%	52%
BLINDS:		Coastal	Mobile	Light	88%	55%
Light color Venetian		Coastal	Permanent	Dark	96%	60%
Closed		Coastal	Permanent	Light	<i>103%</i>	64%
		Inland	None	Dark	81%	50%
		Inland	None	Light	86%	53%
		Inland	Mobile	Dark	90%	55%
		Inland	Mobile	Light	96%	59%
		Inland	Permanent	Dark	105%	65%
		Inland	Permanent	Light	112%	69%
		Mountain	None	Dark	88%	54%
		Mountain	None	Light	94%	57%
		Mountain	Mobile	Dark	98%	60%
		Mountain	Mobile	Light	104%	64%
		Mountain	Permanent	Dark	115%	70%
		Mountain	Permanent	Light	122%	74%
DOUBLE GLAZED IG		Coastal	None	Dark	77%	50%
	1/4" Pilkington		-	-		
1/4" Pilkington Solar-E™ Clear #		Coastal	None	Light	82%	54%
	Low-E#3 surface	Coastal	Mobile	Dark	86%	56%
BLINDS:		Coastal	Mobile	Light	91%	60%
Light color Venetian		Coastal	Permanent	Dark	100%	66%
Closed		Coastal	Permanent	Light	<i>107%</i>	70%
		Inland	None	Dark	85%	55%
		Inland	None	Light	90%	58%
		Inland	Mobile	Dark	94%	61%
		Inland	Mobile	Light	100%	65%
		Inland	Permanent	Dark	<i>110%</i>	71%
		Inland	Permanent	Light	117%	76%
		Mountain	None	Dark	92%	59%
		Mountain	None	Light	98%	63%
		Mountain	Mobile	Dark	102%	65%
		Mountain	Mobile	Light	102%	70%
		Mountain	Permanent	Dark	120%	76%
		Mountain	Permanent	Light	128%	81%
L		Hountain	i Giriancill	Ligit	120 /0	01 /0

Couter Light SINGLE GLAZED SINGLE CLAZED SINGLE CLAZED SINGLE CLAZED Coastal Mone Dark 109% SINGLE GLAZED Coastal Mobile Dark 109% SINGLE GLAZED SINGLE GLAZED IG S	Page 16	Percent of Annealed	Glass Nomina	l Allowable S	Stress		
SINGLE GLAZED Coastal None Dark 105%	GLAZING		LOCATION	SHADOW	FRAME		
Samp	Outer Light	Inner Light			COLOR	Outer	Inner
Samp	SINGLE GLAZED		Coastal	None	Dark	98%	
## 2 surface BLINDS: Coastal Mobile Dark 109%	6 mm Pilkington Solar-E™ Arctic Blue				Light	<i>105%</i>	
BLINDS: Coastal Coastal Coastal Coastal Coastal Coastal Coastal Permanent Clight 116% 136%			Coastal	Mobile	-	109%	
Light Venetian Coastal Permanent Light 138%							
Coastal	_						
Inland None Light 119%							
Inland Mobile Dark 119% 119% 1196 119	Closed		Coastai	remanent	Ligit	130 /0	
Inland Mobile Dark 119% 119% 1196 119			Inland	None	Dark	1070/	
Inland Mobile Dark 119% 127% 1194 1194 127% 1194 11							
Inland Mobile Light 127% 139% 148% 188% 1							
Inland Permanent Dark 139%							
Inland							
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Light Venetian Coastal Permanent Light 148% 66%			Coastal	Mobile	Light	<i>127%</i>	56%
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DOUBLE GLAZED IG 6 mm Pilkington Solar-E™ Arctic Blue BLINDS: Light Venetian Closed Coastal None Light 116% 52%							
6 mm Pilkington Solar-E™ Arctic Blue Energy Advantage™ BLINDS: Light Venetian Closed Inland Inland Inland Inland Mobile Inland Inland Mobile Inland			Mountain	Permanent	Light	1/9%	76%
6 mm Pilkington Solar-E™ Arctic Blue Energy Advantage™ BLINDS: Light Venetian Closed Inland Inland Inland Inland Mobile Inland Inland Mobile Inland	DOUBLE CLAZED TO		Coastal	None	Dark	1000/	400/
Energy Advantage™ Low-E #3 surface Coastal Mobile Light 129% 58% Light Venetian Closed Inland None Dark 120% 53% Inland None Light 128% 56% Inland Mobile Light 128% 56% Inland Mobile Light 142% 62% Inland Mobile Light 142% 62% Inland Permanent Dark 133% 59% Inland Permanent Light 166% 73% Mountain None Dark 131% 57% Mountain None Light 140% 61% Mountain Mobile Dark 146% 63% Mountain Mobile Light 140% 61% Mountain Mobile Light 140% 63% Mountain Mobile Light 140% 61% Mountain Mobile Light 140% 63% Mountain Mobile Light 155% 67% Mountain Mobile Light 155% 67%		6mm Dilkington					
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Mountain Permanent Dark 170% 74%							
Mountain Permanent Light 182% 79%							
			Mountain	Permanent	Light	182%	79%

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	ent of Annealed Glass N					
GLAZING Outer Light	Inner Light	LOCATION	SHADOW	FRAME COLOR	Outer	Inner
SINGLE GLAZED		Coastal	None	Dark	89%	
6 mm Pilkington Solar-E™ Blue-Green		Coastal	None	Light	95%	
#2 surface		Coastal	Mobile	Dark	98%	
#2 surface BLINDS:		Coastal	Mobile			
				Light	105%	
Light Venetian		Coastal	Permanent	Dark	115%	
Closed		Coastal	Permanent	Light	123%	
		Inland	None	Dark	96%	
		Inland	None	Light	<i>103%</i>	
		Inland	Mobile	Dark	<i>107%</i>	
		Inland	Mobile	Light	114%	
		Inland	Permanent	Dark	<i>125%</i>	
		Inland	Permanent	Light	<i>134%</i>	
		Mountain	None	Dark	104%	
		Mountain	None	Light	111%	
		Mountain	Mobile	Dark	116%	
			Mobile		116% 124%	
		Mountain		Light		
		Mountain	Permanent	Dark	136%	
		Mountain	Permanent	Light	145%	
DOUBLE GLAZED IG		Coastal	None	Dark	96%	46%
6 mm Pilkington Solar-E ™ Blue-Green	6 mm Clear	Coastal	None	Light	<i>103%</i>	49%
	•	Coastal	Mobile	Dark	<i>107%</i>	51%
		Coastal	Mobile	Light	114%	55%
BLINDS:		Coastal	Permanent	Dark	125%	60%
Light Venetian		Coastal	Permanent	Light	133%	64%
Closed			remanent	Ligit		
		Inland	None	Dark	<i>106%</i>	50%
		Inland	None	Light	<i>113%</i>	53%
		Inland	Mobile	Dark	117%	55%
		Inland	Mobile	Light	<i>125%</i>	59%
		Inland	Permanent	Dark	138%	65%
		Inland	Permanent	Light	147%	69%
		Imana	remanent	Ligite	247 70	
		Mountain	None	Dark	<i>116%</i>	53%
		Mountain	None	Light	123%	57%
		Mountain	Mobile	Dark	128%	59%
		Mountain	Mobile	Light	137%	63%
		Mountain	Permanent	Dark	150%	70%
		Mountain	Permanent	Light	160%	74%
		Modificant	1 Ciliancia	Ligiti	100 /0	7 1 70
DOUBLE GLAZED IG	6 800 1	Coastal	None	Dark	98%	49%
6 mm Pilkington Solar-E™ Blue-Green	6mm Pilkington	Coastal	None	Light	105%	52%
	Energy Advantage ™	Coastal	Mobile	Dark	<i>109%</i>	54%
BLINDS:	Low-E #3 surface	Coastal	Mobile	Light	<i>116%</i>	58%
Light Venetian		Coastal	Permanent	Dark	<i>128%</i>	64%
Closed		Coastal	Permanent	Light	<i>136%</i>	68%
		Inland	None	Dark	108%	53%
		Inland	None	Light	115%	57%
		Inland	Mobile	Dark	120%	59%
		Inland	Mobile	Light	128%	63%
		Inland	Permanent	Dark	140%	69%
		Inland	Permanent	Light	150%	73%
		Mountain	None	Dark	118%	57%
		Mountain	None	Light	126%	61%
		Mountain	Mobile	Dark	131%	63%
		Mountain	Mobile	Light	<i>140%</i>	68%
		Mountain	Permanent	Dark	<i>154%</i>	74%
		Mountain	Permanent	Light	<i>164%</i>	79%

Pilkington North America, Inc. 811 Madison Avenue, Toledo, Ohio 43604-5684 Telephone: 800 221 0444 Fax 419 247 4517

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a	Percent of Annealed Glas					
GLAZING		LOCATION	SHADOW	FRAME	Outor	Innor
Outer Light SINGLE GLAZED	Inner Light	Coastal	None	COLOR Dark	Outer 94%	Inner
6 mm Pilkington Solar-E™ Grey		Coastal	None	Light	100%	
#2 surface		Coastal	Mobile	Dark	104%	
BLINDS:		Coastal	Mobile	Light	111%	
Light Venetian		Coastal	Permanent	Dark	122%	
Closed		Coastal	Permanent	Light	130%	
				3		
		Inland	None	Dark	<i>102%</i>	
		Inland	None	Light	<i>109%</i>	
		Inland	Mobile	Dark	114%	
		Inland	Mobile	Light	<i>121%</i>	
		Inland	Permanent	Dark	<i>133%</i>	
		Inland	Permanent	Light	142%	
		Mountain	None	Dark	111%	
		Mountain	None	Light	119%	
		Mountain	Mobile	Dark	123%	
		Mountain	Mobile	Light	132%	
		Mountain	Permanent	Dark	144%	
		Mountain	Permanent	Light	<i>154%</i>	
		<u> </u>		-		
DOUBLE GLAZED IG		Coastal	None	Dark	<i>102%</i>	47%
6 mm Pilkington Solar-E™ Grey	6 mm Clear	Coastal	None	Light	<i>109%</i>	50%
		Coastal	Mobile	Dark	113%	52%
		Coastal	Mobile	Light	121%	55%
BLINDS:		Coastal	Permanent	Dark	133%	61%
Light Venetian		Coastal	Permanent	Light	142%	65%
Closed		Inland	None	Dark	1120/	50%
		Inland	None None	Dark	113%	54%
		Inland	Mobile	Light Dark	120% 125%	54% 56%
		Inland	Mobile	Light	133%	60%
		Inland	Permanent	Dark	146%	65%
		Inland	Permanent	Light	<i>156%</i>	70%
		mana	remanent	Ligite	150 70	7070
		Mountain	None	Dark	123%	54%
		Mountain	None	Light	132%	58%
		Mountain	Mobile	Dark	<i>137%</i>	60%
		Mountain	Mobile	Light	<i>146%</i>	64%
		Mountain	Permanent	Dark	<i>160%</i>	70%
		Mountain	Permanent	Light	171%	75%
					40401	100/
DOUBLE GLAZED IG	Corne Dillièretes	Coastal	None	Dark	104%	49%
6 mm Pilkington Solar-E™ Grey	6mm Pilkington	Coastal	None	Light	111%	52%
BLINDS:	Energy Advantage™ Low-E #3 surface	Coastal	Mobile Mobile	Dark	115% 123%	54% 58%
Light Venetian	LOW-E #3 Surface	Coastal Coastal	Permanent	Light Dark	125% 135%	58% 63%
Closed		Coastal	Permanent	Light	135% 144%	68%
Closed		Coastai	remanent	Ligit	144 /0	00 /0
		Inland	None	Dark	115%	53%
		Inland	None	Light	122%	56%
		Inland	Mobile	Dark	127%	58%
		Inland	Mobile	Light	<i>136%</i>	62%
		Inland	Permanent	Dark	149%	68%
		Inland	Permanent	Light	<i>159%</i>	73%
				<u>.</u> .		
		Mountain	None	Dark	125%	57%
		Mountain	None	Light	134%	60%
		Mountain	Mobile	Dark	139%	63%
		Mountain	Mobile	Light	149%	67%
		Mountain	Permanent	Dark	163%	74%
		Mountain	Permanent	Light	174%	79%