

November 2018

To Whom It May Concern:

VELUX Australia Pty Ltd supplies the following information.

- VELUX Skylights FCM/FS/VS/VSE/VSS/VCE/VCM/VCS, Roof Windows GGL/GHL/GPL and sun tunnels TWR/TWF supplied in Australia have been tested to, and meet, Australian Standard AS4285-2007 for skylights. (table 1)
(GPL/TWR/TWR not tested for cyclonic regions)
- VELUX Skylights and Roof Windows with High Performance laminated glazing are manufactured with Grade A safety laminated glass and meet Australian Standard AS1288-2006 for sloped overhead glazing. Report from Calderone and Associates available on request.
(Skylight FCM/FS/VS/VSE/VSS/VCE/VCM/VCS glazing variant 04)
(Roof Window GGL/GHL/GPL glazing variant 76)
- VELUX Skylights FCM/FS/VS/VSE/VSS/VCE/VCM/VCS and Roof Windows GGL/GHL/GPL with High Performance glazing have been tested to, and pass, bushfire attack level (BAL) 40 - per AS3959-2009 bushfire requirements. Sun tunnel TWR has tested to, and passed, BAL 29.
(table 2)
- VELUX skylights comply with BCA 3.12.1.3 thermal requirements.
(table 3)
- VELUX Skylights with Comfort double glazing reduce sound by approx 29 decibels.
VELUX Skylights with High Performance laminated glazing reduce sound by approx 32 decibels.
VELUX Roof Windows with laminated glazing reduce sound by approx 35 decibels.
All VELUX double glazed units have been tested to Australian standards for Rw and STC ratings.
(table 4)
- VELUX Skylights FCM/FS/VS/VSE/VSS/VCE/VCM/VCS and Roof Windows GGL/GHL/GPL have been assessed as suitable for boundary installations where the BCA requires non-combustible materials.
(opening models assessed in the closed position)
CSIRO letter of assessment available on request.
- All VELUX double glazed units are argon gas filled with additional Low-E coating.
(Skylight FS/VS glazing variant 05: 95% UV reduction)
(Skylight FCM/FS/VS/VSE/VSS/VCE/VCM/VCS glazing variant 04: 99% UV reduction)
(Roof Window GGL/GHL/GPL glazing variant 76: 95% UV reduction)

Table 1

AS4285 – Skylights: Watertightness, Concentrated Load, Non-cyclonic & Cyclonic wind pressures					
Model	IBA Test No:	Watertightness ^	Concentrated Load ^ (1.1kN)	Non-Cyclonic (static pressure – single pulse)	Cyclonic & Northern Territory Per NCC guidelines. (fatigue test – 10,000 pulses)
FCM 4646 0004B *	2009-098-S5 2009-098-S6	PASS	PASS	+7.2 and -7.3 kPa	-5.0 kPa
FS S06 2004A	2009-098-S1 2009-098-S12	PASS	PASS	+4.0 and -4.0 kPa	-2.4 kPa
VS/VSE/VSS S06 2004A	2009-098-S10 2009-098-S16 2015-014-S5	PASS	PASS	+5.0 and -6.5 kPa	-2.8 kPa
GGL M08 3076	4023S8-GGL 2009-098-S8	PASS	PASS	+5.0 and -7.0 kPa	-4.0 kPa
GGL SK06 3076	2014-067-S1 2014-067-S3	PASS	PASS	+4.0 and -6.0kPa	-4.0 kPa
GPL SK06 3076	2014-067-S2 2014-067-S5	PASS	PASS	+4.0 and -2.5 kPa	N/A
TWF/R 014 (V1.0)	4023S12-TWF	PASS	PASS	+4.0 and -5.0 kPa	N/A
TWF/R 0K14 (V2.0)	2015-014-S1	PASS	PASS	+5.0 and -7.0 kPa	N/A
VCE 4646 00004AC	2012-099-S1 2012-099-S2 2012-099-S4	PASS	PASS	+3.75 and -3.75 kPa	-1.5 kPa
VCM 4646 2004AD	2017-016-S5 2017-016-S10	PASS	PASS	+4.5 and -5.0 kPa	-2.16 kPa -3.21kPa (AS4040)
VCS 4646 2004AD	2017-016-S1 2017-016-S8	PASS	PASS	+4.5 and -4.0 kPa	-2.16 kPa -3.21kPa (AS4040)

NATA Approved Test Facility: Ian Bennie & Associates, Dandenong. Victoria

^ **PASS** applies to both 04 & 05 glazing for FS & VS

* **Cyclonic testing:** FCM tested on a timber base, secured with VELUX screws.

✂ **Cyclonic testing:** VCM/VCS tested on a timber base, secured with #8 roofing screws (not supplied by VELUX). Secondary results achieved per AS4040 guidelines.

Table 2

AS3959 – Construction of Buildings in Bushfire-prone Areas				
Model	Exova Warringtonfire Test report	BAL 29 + <i>18-75 degree roof pitch</i>	BAL 40 * <i>0-18 degree roof pitch</i>	BAL 40 * <i>18-75 degree roof pitch</i>
FCM 4646 0004B	EWFA 2548902.1	-	PASS	-
FCM 4646 0004B	EWFA 2391800.2	-	-	PASS
FS S06 2004A	EWFA 2398200.2	-	-	PASS
VS S06 2004A	EWFA 2398100.3	-	-	PASS
VSE S06 2004A	EWFA 2548900.1	-	-	PASS
GGL SK06 3076F	EWFA 31155000.1	-	-	PASS
GPL SK06 3076F ^	EWFA 31154900.1	-	-	PASS (with EDW flashing)
VSS S06 2004AD ^	EWFA 31154800.1	-	-	PASS (with EDW flashing)
VCE 4646 0004AC	EWFA 2686100.2	-	PASS	-
VCM / VCS 4646 2004AD	EWFA 46234000.1 Assessment Report	-	PASS**	PASS**
GGL SK06 2076 GPL SK06 2076	EWFA 43664500 Assessment Report	-	-	PASS**
GHL M08 3076	EWFA 2548901.1	-	-	PASS
TWR 0K14 2010	EWFA 34505800.1	PASS	-	-

NATA Approved Test Facility: Exova Warringtonfire, Dandenong, Victoria

* *PASS applies only to High Performance laminated glazing (04 & 76)*

+ *PASS applies only to TWR rigid shaft*

^ *GPL SK06 and VSS S06 tested with VELUX EDW flashing. All other models tested with custom built flashing (not supplied by VELUX)*

***Product assessed by Exova – based on previous test results*

NB: VELUX EDW flashings suit Skylights and Roof Windows FS/VS/VSE/VSS/GGL/GHL/GPL

NB: VELUX recommends FCM/VCE/VCM/VCS/VSS installed at a maximum 60 degrees.

VELUX recommends GHL/GPL installed at a maximum 55 degrees.

VELUX recommends TWR installed at a maximum 60 degrees.

NB: All opening Skylights/Roof Windows tested in the closed position. Consult with local council as fire resistant mesh may be required. (not supplied by VELUX)

Table 3

BCA Thermal Requirements					
Model: Skylight	Glazing (IGU)	U=Value (W/m²*K)	SHGC Solar Heat Gain CO-efficient	VT Visible Light Transmittance	Luminous Efficacy (Ke) Ke = VT/SHGC
VSE Opening Skylight VSS Opening Skylight ^	Type 04	2.5	0.21	0.48	2.29
VS Opening Skylight	Type 04	2.5	0.21	0.48	2.29
	Type 05	2.6	0.21	0.49	2.33
FS Fixed Skylight	Type 04	2.6	0.24	0.55	2.29
	Type 05	2.7	0.24	0.56	2.33
FCM Fixed Skylight	Type 04 ♦	2.9	0.28	0.64	2.29
VCE Opening Skylight VCM Opening Skylight * VCS Opening Skylight *	Type 04 ♦	2.9	0.24	0.55	2.29

Thermal figures generated by AFRC accredited laboratory:
Ian Bennie & Associates, Dandenong, Victoria.

Ke is the relationship of light vs heat.

A standard vertical single glazed window has a Ke of 0.7.
ie: a single glazed vertical window lets in 0.7 units of light for every unit of heat. (less light, more heat)

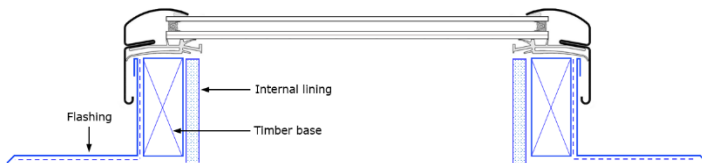
A thermally efficient double glazed VELUX skylight lets in 2.29 units of light for every unit of heat.
ie: More light, less heat

All Skylight values based on AFRC calculations. All values audited by AWA (Australian Window Association)
Link: <http://werscpd.net.barberrv.arvix.com/skylighttable.aspx?Manufacturer=VELUX>

^ VSS not calculated – VSE/VSS have the same configuration 04 glazing.
* VCM/VCS not calculated – VCE/VCM/VCS have the same configuration 04 glazing.

♦ FCM/VCE/VCM/VCS figures generated with timber base and internal lining (gyprock) – not supplied by VELUX.
(See picture below)

♦ FCM on timber base



Model: Roof Window	Glazing (IGU)	U=Value (W/m²*K)	SHGC Solar Heat Gain CO-efficient	VT Visible Light Transmittance	Luminous Efficacy (Ke) Ke = VT/SHGC
GGL Opening Window GPL Opening Window	Type 76	1.3	0.31	0.64	2.06

Roof Window values based on EU calculations. (EN 14351-1:2006+A2:2016)



Table 4

AS1191 – Acoustics

Model:	FCM 4646 2004	VCM 4646 2004	FS S06 2004	VSS S06 2004	GGL SK06 2076
Rw	29 dB	30 dB	32 dB	32 dB	34 dB
STC	29	31	32	32	34

Acoustic values calculated by CSIRO Laboratories, Clayton Victoria.