

Bulletin

Roof Testing Laboratory (ISO/IEC 17025)

UL Third Party Test Data Program participant



Roof System Dynamic Wind Uplift Resistance Results

File number:	PTFS-258762
Test date:	2020-02-25
Reappraisal date:	2027-01-18



TPO MEMBRANE SYSTEM WITH VENTURIS

Tested Roofing System Summary

Cap sheet membrane:	TPO membrane / Loose laid with venturi system
Base sheet membrane:	n/a
Cover board:	Polyisocyanurate board 4 x 8 ft x ½ in / Immobilized with adhesive dots
Insulation:	Polystyrene insulation board 4 x 4 ft x 4 in / Loose laid
Vapour barrier:	Self-adhesive membrane
Thermal barrier:	Optional
Decking:	Steel deck

Dynamic Uplift Resistance (DUR) as per CSA A123.21⁽¹⁾

System Designation	Sustained Pressure (S.P.) (measured)	As per CSA A123.21:20 DUR = (S.P. x 0,65)	As per CSA A123.21:14 DUR = (S.P. ÷ 1,5)
A	-4,8 kPa (-100 psf)	-3,1 kPa (-65 psf)	-3,2 kPa (-67 psf)

⁽¹⁾ See declaration of conformity on page 7.



According to the scope of accreditation published on the SCC website
File No. 797

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

Products

CAP SHEET MEMBRANE				
TESTED PRODUCT: Two-ply membrane composed of thermoplastic polyolefin and reinforced with polyester.				
System	Securement Method			
A	⁽²⁾ Loose laid, with 1 venturi per 144 ft ² , overlaps fused over 1,5 in.			
ELIGIBLE PRODUCT(S)				
Lexcan	Hi-Tuff TPO (60 mil)	Hi-Tuff TPO XTRA (80 mil)	Hi-Tuff TPO HS (60 mil)	Hi-Tuff TPO XTRA HS (80 mil)

⁽²⁾ The ratio of venturi per surface depends on several factors: project geometry, location (corner, perimeter or field) of venturis, roof projections, to name but a few. See limitations and comments on page 7 for more details.

BASE SHEET MEMBRANE
TESTED PRODUCT: n/a

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

COVER BOARD				
TESTED PRODUCT: Polyisocyanurate board laminated to a mineral coated fiberglass reinforced facer.				
System	Securement Method		Securement Rate	
A	Immobilized with adhesive dots		6 dots per 4 x 8 ft board	
ELIGIBLE THICKNESS(ES)				
½ in minimum				
SECUREMENT METHOD				
Aphalt Adhesive				
SECUREMENT PATTERN				
ELIGIBLE PRODUCT(S)				
Lexcor	Lexboard			
Georgia-Pacific	DensDeck	DensDeck Prime		
USG	Securock Gypsum fiber Roof Board			
Unifix	PermaBase Dek			
National Gypsum	DEXcell Cement Roof Board	DEXcell FA Glass Mat Roof Board		
Generic	Gypsum board			

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

INSULATION				
TESTED PRODUCT: Expanded polystyrene insulation board.				
System	Securement Method		Securement Rate	
A	Loose laid		n/a	
ELIGIBLE THICKNESS(ES)				
4 in minimum				
ELIGIBLE PRODUCT(S)				
FRANSYL	Izolon HR	Izolon THR	Izolon HD	Izolon THD
Lexcor	Isolex	Isolex II	Isolex Mach 12	
IKO	IKOTherm	IKOTherm II		
Atlas Roofing Corp.	ACFoam II	ACFoam III		
Johns Manville	ENRGY 3	ENRGY 3 CGF		

ADDITIONAL INSULATION				
TESTED PRODUCT: Optional (same eligible products as top row).				
ELIGIBLE PRODUCT(S)				
Generic	Any type of slope insulation			

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

VAPOUR BARRIER				
TESTED PRODUCT: Self-adhesive membrane composed of a non-asphaltic adhesive backing and a reinforced surface of woven polypropylene laminated with a non-woven polyester.				
System	Securement Method			Primer
A	Self-adhered			Ultrastick
ELIGIBLE PRODUCT(S) : Vapour barrier				
Adhered membranes				
Lexcor	Permate Stick			
Fused membranes (on compatible substrate)				
Lexcor	Vanguard 95 SF	Vanguard 180 SF		
IKO	Torchflex 95 SF	Torchflex 180 SF		
ELIGIBLE PRODUCT(S) : Primer				
With adhered membranes				
Lexcor	Ultrastick	Multigrip		
With fused membranes				
Lexcor	Lexprime TG			

THERMAL BARRIER				
TESTED PRODUCT: Optional.				
ELIGIBLE PRODUCT(S)				
Georgia-Pacific	DensDeck	DensDeck Prime		
USG	Securock Gypsum Fiber Roof Board			
National Gypsum	DEXcell	DEXcell FA	DEXcell Cement Board	
Application method: adhered or mechanically fastened. The securement method, rate and thickness to meet codes requirements, are the designer's responsibilities.				

FASTENERS				
TESTED PRODUCT(S) : n/a				

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

ADHESIVE				
TESTED PRODUCT: Fast-setting flexible polyurethane foam adhesive.				
System	Ribbon's spacing		Primer	
A	6 dots per 4 x 8 ft board		n/a	
ELIGIBLE PRODUCT(S)				
Lexcor	Adphalt			

DECKING				
PRODUCT: Steel deck.				
Grade	Thickness (in)	Yield strength (ksi)	Span spacing (in)	Fasteners spacing (in)
230	0,03	33	54	6
On a building, the decking must be fastened to the supporting structure with sufficient strength to withstand wind uplift loads (weighted according to NBC requirements).				



Declaration of conformity to the standard

The scope of the CSA A123.21 standard includes MARS (Membrane Attached Roofing System), PARS (Partially Attached Roofing System) and AARS (Adhesive Applied Roofing System). The standard is mute regarding a loose laid roofing system that is maintained in place by the dynamic action of the wind through the mean of venturis.

Limitations and comments

EXP declares that the results presented in this bulletin must be regarded as an engineering opinion rather than a strict measurement of wind uplift resistance in accordance with the standard.

The system presented in this bulletin has many specific construction details, on which the final performance depends. It is the responsibility of the designer and the roofing contractor to ensure that they have all the information they need to carry out the project.

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

General Notes

1. Source:

This publication is based on a test conducted by **EXP Services inc.**

2. Deck equivalency products:

18 to 22 gage steel deck. Wood or concrete deck which testing gave equivalent or superior uplift resistance than the value specified in the "Fasteners Pull Out Resistance" section.

3. Fasteners Pull Out Resistance:

Tests were conducted in laboratory according to ANSI/SPRI FX-1 standard, over a minimum of 10 specimens over steel deck (unless stated otherwise).

4. Adhesive Pull Resistance (when applicable):

Tests were conducted in laboratory over 3 test samples, according to ANSI/SPRI IA-1 standard over steel deck (unless stated otherwise) or, according to ASTM D1623 standard.

5. Note on adhesive:

It is EXP opinion that the application of the adhesive beads in an "S" or straight-line arrangement will not affect the results of this publication. The intention at the job site should be that the glue bead spacings be reasonably distributed on the substrate, in order to come as close as possible to the theoretical patterns when the boards are laid in. Comply with all additional manufacturer's requirements regarding the use of adhesives.

6. Liquid primers and adhesives:

Please observe the application rates specified by the manufacturers, as well as any additional requirements when applying liquid primers and adhesives.

7. Equivalent products:

Only the products listed in this report under eligible products are deemed acceptable as substitute to the tested products. Any other modifications must be formally requested to EXP to be studied for approval.

8. Optional components:

Any components of this roofing system listed as optional, may be removed from the roof design. Inclusion or exclusion of the said component having no effect on the published dynamic uplift resistance results. (DUR).

9. Building Wind Load Calculation:

An online calculator will compute the Wind Load of any given building, for field, perimeters and corners, as per 2015 NBC requirement. It will also provide the dimensions of the perimeter and corner areas. The calculator is available at <https://nrc.canada.ca/en/research-development/products-services/software-applications/wind-load-calculators-roof-cladding-vegetated-roof-assembly>

Roof Testing Laboratory (ISO/IEC 17025)



Roof System Dynamic Wind Uplift Resistance Results

PTFS-258762

10. Dynamic Uplift Resistance (DUR) calculation:

CSA A123.21 (2014 and earlier) specified to divide the measured result by 1,5 to obtain the effective wind resistance (DUR).

CSA A123.21 (2020) suggest to multiply the measured result with 0,65 to obtain the effective wind resistance (DUR).

11. Technical Advisories:

This roof system assessment reports must be read in conjunction with any issued technical advisories from EXP.

12. Notice:

EXP reserves the right to withdraw, without prior notice, any Bulletin of Roof System Dynamic Wind Uplift Resistance Results published and/or make any necessary corrections.

The information in this roofing system report (the "Report") are based on the tests run by EXP of certain combination of materials in a specific and controlled condition to determine the resistance of different roofing systems to wind uplift forces (the "Test"). The results of the Test are subject to certain prerequisite conditions and assumptions made during the Test. In this regard, the Report is for the exclusive use of EXP client for whom the Report was prepared. The information contained in the Report must not be reproduced, used or relied upon in whole or in part without the written consent of EXP. Any third-party user assumes sole responsibility for the use it makes of the information in the Report including but not limited to any decision to purchase roofing material in reliance of the information found in the Report or on the Site. **Exp disclaims all warranties as to the accuracy, completeness, or adequacy of the information in the Report or on the Site and accepts no responsibility for damages suffered by any third party arising out of decisions made or actions based on the Report.**

13. Version tracking table:

2024-01-18	First edition.

Prepared by:

EXP Services Inc.

Serge Rochon, P. Eng.
O.I.Q. N° : 114865
P.E.O. N° : 100023274
Provincial Manager – Building science and CSA laboratory

2024-01-18
Date