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ENGINEER TEST CONSULT

ROOF SYSTEM ASSESSMENT REPORT DYNAMIC UPLIFT RESISTANCE PER CSA A123.21			
CUSTOMER:	Amrize Building Envelope LLC (Duro-Last)	TEST DATE:	2019-06-06
DOCUMENT NO.	DL-MARS-15	PUBLICATION DATE:	2025-07-11
TEST PANEL NO.	DL-D3	REVISION NO.	4
SYSTEM TYPE:	C-2	REEVALUATION DATE:	2028-07-10

MECHANICALLY ATTACHED ROOFING SYSTEM (MARS) SUMMARY	
ROOFING SYSTEM SUMMARY:	
Roof Cover:	PVC or KEE/PVC co-polymer single ply, induction welded
Insulation (top):	Polyisocyanurate foam, gypsum-based or cement-based board
Insulation (base):	Polyisocyanurate foam or polystyrene board, loose-laid
Vapor Barrier:	Proprietary extruded polyethylene film
Deck:	steel

DYNAMIC UPLIFT RESISTANCE PER CSA A123.21:

Sustained Test Value		Design Value CSA A123.21:20 *(Test Value x 0.65)*		Design Value CSA A123.21:14 *(Test Value ÷ 1.5)*	
kPa	**psf**	**kPa**	**psf**	**kPa**	**psf**
-4,2	-88	-2,7	-57	-2,8	-59

PRODUCTS / APPLICATION:

Roof Cover:	Description:	Membrane composed of polyester reinforcement coated with PVC or KEE/PVC co-polymer compound		
	Application:	Induction welded		
	Eligible Products:	Duro-Last (min. nominal 40-mil), Duro-Last X (min. nominal 80-mil), Duro-Last EV (min. nominal 50-mil) or Duro-Tuff (min. nominal 50-mil)		
Insulation (top):	Description:	Polyisocyanurate foam, gypsum-based or cement-based board		
	Application:	Mechanically fixed		
	Eligible Products:	**By**	**Product**	**Min. Thickness**
		Amrize	Duro-Guard ISO II-A, Duro-Guard ISO II-E2, Duro-Guard ISO II-H, Duro-Guard ISO III-A, Duro-Guard ISO III-E2 or Duro-Guard ISO III-H	38-mm (1.5-inch)
		Georgia-Pacific	DensDeck Prime, DensDeck StormX Prime	13-mm (0.5-inch)
		USG	SECUROCK Gypsum-Fiber Roof Board	
		National Gypsum	DEXcell Cement Roof Board	11-mm (7/16-inch)

PRODUCTS/APPLICATION (CONTINUED):

<table>
<tr><td rowspan="6">Insulation (top) Fasteners:</td><td>Description:</td><td colspan="3">Corrosion resistant screw-type roofing fasteners with steel stress plates coated with proprietary coating</td><td rowspan="3">  </td></tr>
<tr><td>Fastening Method:</td><td colspan="3">Fasteners installed through stress plates to engage the top flanges of the steel deck</td></tr>
<tr><td>Fastening Rate:</td><td colspan="3">1 part per 0.37 m^2 (4 ft^2)
0.61 x 0.61 m (2 x 2 ft) staggered grid</td></tr>
<tr><td rowspan="5">Eligible Products:</td><td>By</td><td>Fasteners</td><td colspan="2">Plates</td></tr>
<tr><td>Amrize</td><td>Duro-Last #15 Extra Heavy Duty Fastener</td><td colspan="2">Duro-Bond ISO WELD 1302-1, Duro-Bond Plate 1302 or Duro-Bond PVC IW Plate</td></tr>
<tr><td>Altenloh, Brinck & Co.</td><td>Trufast #15 EHD Fastener</td><td colspan="2">Trufast PVC IW Plate</td></tr>
<tr><td>OMG</td><td>OMG XHD</td><td colspan="2">RhinoBond Insulation Plate-PVC</td></tr>
<tr><td>SFS Group</td><td>DF-#15-PH3</td><td colspan="2">isoweld F1-P-6.8-PVC Plate</td></tr>
<tr><td rowspan="7">Insulation (base):</td><td>Description:</td><td colspan="4">Polyisocyanurate foam or polystyrene board</td></tr>
<tr><td>Application:</td><td colspan="4">One or more layer(s), loose-laid with staggered joints</td></tr>
<tr><td rowspan="5">Eligible Products:</td><td>By</td><td colspan="2">Product</td><td>Min. Thickness</td></tr>
<tr><td>Amrize</td><td colspan="2">Duro-Guard ISO II-A, Duro-Guard ISO II-E2, Duro-Guard ISO II-H, Duro-Guard ISO III-A, Duro-Guard ISO III-E2 or Duro-Guard ISO III-H</td><td rowspan="4">25-mm (1-inch)</td></tr>
<tr><td>Beaver Plastics</td><td colspan="2">Terrafoam® EPS Rigid Insulation</td></tr>
<tr><td>Insulfoam, LLC</td><td colspan="2">R-TECH®</td></tr>
<tr><td>Perma R Products, Inc.</td><td colspan="2">PolyPro</td></tr>
<tr><td rowspan="3">Vapour Barrier:</td><td>Description:</td><td colspan="4">extruded polyethylene film</td></tr>
<tr><td>Application:</td><td colspan="4">Loose-laid with taped joints</td></tr>
<tr><td>Eligible Products:</td><td colspan="4">Duro-Blue</td></tr>
<tr><td rowspan="3">Thermal Barrier: (Optional)</td><td>Description:</td><td colspan="4">Cement-based, gypsum-based or mineral-wool board</td></tr>
<tr><td>Application:</td><td colspan="4">Loose-laid, adhered or mechanically-fixed</td></tr>
<tr><td>Eligible Products:</td><td colspan="4">Any approved product acceptable to the named customer and the Authority Having Jurisdiction</td></tr>
<tr><td>Deck:</td><td>Tested Product:</td><td colspan="4">Steel roof deck</td></tr>
</table>

NOTES:	
Test Value and Design Value:	The "Test Value" noted herein reflects the ultimate passing test pressure recorded during testing. The "Design Value" herein reflects the "Test Value" multiplied by a resistance factor of 0.65 (same as "Test Value" divided by a safety factor of 1.5) The "Design Value" should meet or exceed the design pressure requirements of the project, as determined in accordance with the current National Building Code of Canada (NBC) requirements.
Equivalence of Other Products:	This report applies only to the products listed as "Eligible Products" herein.
Optional Components:	Components listed herein as "optional" may be removed from the roof system design with no adverse effect on system dynamic wind uplift performance.
As-Tested Deck:	Testing utilized 22 ga., Type B (6-inch deck module) steel deck meeting ASTM A653, A792, A1008 or CSSBI 10M standard and having a yield strength of 275 MPa (40-ksi). Alternate deck displaying equivalent strength and fastener-holding capacity (withdrawal resistance) may be specified at the discretion of the Designer of Record to the satisfaction of the Authority Having Jurisdiction.

Fastener Point-Loads:	Point-Load			
	Sustained Test Value		Design Value	
	N	lbf	N	lbf
	1566	352	1018	229

RSAR SCOPE

Roof System Assessment Reports (RSAR) constitute a summary of allowable products and interfaces used in low-slope roof assemblies based testing in accordance with CSA A123.21 at our ISO/IEC 17025 accredited laboratory.

While RSAR's are reviewed and renewed each 3-years based primarily on report holder declaration, these are not Certification listings, and are not intended to state or imply ongoing quality control / surveillance activities by NEMO at the report holder's facilities.

NEMO ETC, LLC is not, in any way, the Designer of Record for any project on which these RSAR's, or previous versions thereof, is/was used for permitting or design guidance. RSAR's are not to be construed as representing any attributes not specifically listed, nor to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by NEMO ETC, LLC, express or implied, as to any finding or other matter in these RSAR's, or as to any product covered by the RSAR's.

NEMO ETC CREDENTIALS

TYPE	ENTITY	REFERENCE
ISO/IEC 17025 Accreditation	International Accreditation Service (IAS)	TL-689
TAS 301 Certification	Miami-Dade	21-0409.01
Third Party Test Data Program	UL, LLC	DA2862
Test Lab Listing	Roofing Contractors Association of British Columbia	RCABC Labs

REPORT HISTORY

DATE	EVENT	NOTES	AUTHORIZED BY:
2021-01-11	FINAL	None	RN
2021-04-22	REV1	Additional base insulation options; add Duro-Last X (80-mil)	RN
2021-09-15	REV2	Additional top layer insulation options	RN
2022-07-12	REV3	Re-Validation	RN
2025-07-10	REV4	Re-Validation, reformat, additional insulation options	RN

END OF REPORT