Released by UL Environment
Date Issued: November 11, 2019
Product ID#: 1000780313-2536122
Test Report #: 1000780313-2536122

BCM2

GREENGUARD CERTIFICATION TEST REPORT					
Customer Information	NEVPANEL YAPI MADEN URETIM ITH.IHR.SAN. VE TIC.LTD.STI. ELIF SEN BAGDAT CADDESI COLAKOGLU IS MERKEZI NO:458 / 22 MALTEPE ISTANBUL TURKEY				
Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel				
Test Group	Magnesium Oxide Boards - 01				
Category	Building Products				
Test Type	Certification	Year 5			
Test Method	UL 2821 "GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings Using Dynamic Environmental Chambers"				

	Environment	TVOC	Formaldehyde	Total Aldehydes	CREL/TLV
GREENGUARD	Office	✓	✓	✓	✓
GREENGUARD Gold	Office	✓	✓	✓	✓
	Classroom	✓	✓	✓	✓

✓ - meets criteria; X - over criteria

Laboratory Approval

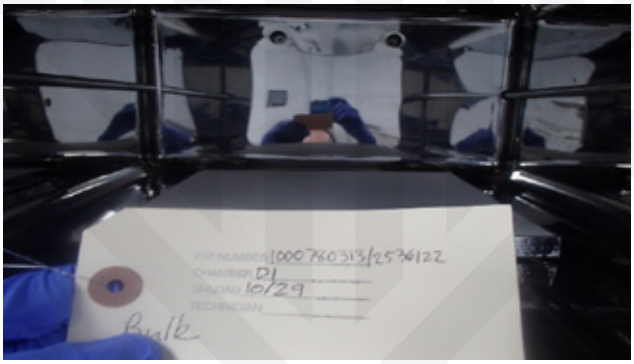
Allyson M. McFry
Chemistry Laboratory Director

MODELING FOR PREDICTED AIR CONCENTRATION

Certification Program	Environment Basis	Modeling Basis	Surface Area (m^2)	Room Volume (m^3)	ACH (1/hr)
GREENGUARD and GREENGUARD Gold Office	CDPH/EHLB/Standard Method	wall	33.4	30.6	0.68
GREENGUARD Gold Classroom	CDPH/EHLB/Standard Method	wall	94.6	231	0.82

Note that certain environments and/or modeling scenarios may prevent assessment of low level CREL and TLV analytes due to the emissions being below the lower LOQ (0.04 µg). For example, benzene ½ CREL is 1.5 µg/m³.

PHOTOGRAPH OF SAMPLE



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GREENGUARD RESULTS SUMMARY

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel		
GREENGUARD Acceptable IAQ Criteria		**168 Hour Product Measurement**	**Product Compliance for IAQ**
TVOC[a]	≤ 0.5 mg/m³	0.30 mg/m³	Yes
Formaldehyde	≤ 0.05 ppm	< 0.003 ppm	Yes
Total Aldehydes[b]	≤ 0.10 ppm	0.012 ppm	Yes
Individual VOCs	all ≤ 1/10 TLV	----------[c]	Yes

[a] "TVOC" is the sum of all VOCs measured via TD/GC/MS which elute between n-hexane (C_6) and n-hexadecane (C_{16}) quantified using calibration to a toluene surrogate.

[b] "Total Aldehydes" is the sum of all measured normal aldehydes from formaldehyde to nonanal, plus benzaldehyde. Heptanal through nonanal are analyzed using TD/GC/MS. The remaining aldehydes are analyzed using HPL/UV methodology. All aldehydes are quantified to authentic standards.

[c] All individual VOCs detected met the criteria of less than 1/10 the ACGIH established threshold limit values (TLVs).

PROJECT DESCRIPTION

This study was conducted using a UL Environment's GREENGUARD test method following the requirements of GREENGUARD Certification program. The product was monitored for emissions of total volatile organic compounds (TVOC), formaldehyde, target list aldehydes, and other individual volatile organic compounds (VOCs) over a 168 hour exposure period. These emissions were measured and the resultant air concentrations were determined for each of the potential pollutants. Determination of compliance is based on predicted air concentrations modeled using the GREENGUARD program room loading.

Report Outline:

For UL Environment's technical references and resources click here or https://industries.ul.com/wp-content/uploads/sites/2/2018/02/Technical-references-and-resources.pdf

For Product Evaluation Methodologies information click here or https://industries.ul.com/wp-content/uploads/sites/2/2018/02/Product-Evaluation-Methodologies-GG.pdf

For Quality Control Program or Environmental Chamber Evaluations information click here or https://industries.ul.com/wp-content/uploads/sites/2/2018/02/Quality-Control-Procedures.pdf

For RSD, Quality Assurance Report or other quality documents, Request here or contact ULE.

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TABLE 1

ENVIRONMENTAL CHAMBER STUDY PARAMETERS	
Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel
Product Manufacture Date	November 26, 2018
Product Collection Date	October 15, 2019
Product Shipping Date	October 15, 2019
Date Received	October 17, 2019
Accredited Laboratory Location*	ULE - Marietta
Test Description	The product was received by UL Environment as packaged and shipped by the customer. The package was visually inspected and stored in a controlled environment immediately following sample check-in. Just prior to loading, the product was unpackaged and prepared for the required loading to expose the top surface only. The sample was placed inside the environmental chamber, and tested according to the specified protocol.
Test Period	10/22/2019 - 10/29/2019**
Area	one-sided area = 0.0858 m²
Chamber Volume	0.0855 m³
Product Loading	1.00 m²/m³
Test Conditions	1.00 ± 0.05 ACH 50% RH ± 5% RH 22.5ºC - 23.2

**The manufacturing date was not within 10 days of receipt and testing of product.

The temperature range specification is 23°C ± 1°. The actual temperature range listed above may vary slightly. If the range is outside this specification, data was reviewed to ensure a negative impact did not occur.

*Accredited Laboratory Locations	
Location	**Address**
ULE - Marietta	UL Environment 2211 Newmarket Parkway, Marietta, GA 30067-9399 USA
ULE - Guangzhou	UL Verification Services (Guangzhou) 1-3F & Room 501, Building 2 (R&D Center A1), No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China
ULE - Cabiate	UL International Italia S.r.l ATTN: IAQ Laboratory Via Europa, 9, I – 22060 – Cabiate (Como), Italia
ULE - Vietnam	UL VS (VIET NAM) CO. LTD., Lot C5, Conurbation 2, Street K1, Cat Lai Industrial Zone, Thanh My Loi Ward, District 2, Ho Chi Minh City, Vietnam
UL - Shimadzu	Shimadzu Techno-Research, Inc. 1, Nishinokyo-Shimoaicho Nakagyo-ku, Kyoto 604-8436 Japan
KCL	Korea Conformity Laboratories #805, I-Valley, 149 Gongdan-ro Gunpo-si, Gyeonggi-do, 15849 Korea

This test is accredited and meets the requirements of ISO/IEC 17025 as verified by ANSI National Accreditation Board. Refer to certificate and scope of accreditation AT-1297.

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TABLE 2

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel

TVOC CHAMBER CONCENTRATIONS, EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS

Elapsed Exposure Hour*	Chamber Concentration µg/m³	Emission Factor µg/m²•hr	Predicted Air Concentration** µg/m³
0 (Background)	BQL	BQL	---
6	447	446	715
24	287	287	475
48	287	286	441
72	251	250	408
96	188	188	379
168	186	185	302
1st Order Exponential Decay Constant = k_T = 0.003			

FORMALDEHYDE CHAMBER CONCENTRATIONS, EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS

Elapsed Exposure Hour*	Chamber Concentration µg/m³	Emission Factor µg/m²•hr	Predicted Air Concentration**	
			µg/m³	ppm
0 (Background)	BQL	BQL	---	---
6	2.9	2.9	5	0.004
24	2	2.0	< 3	< 0.003
48	2.2	2.2	< 3	< 0.003
72	BQL	BQL	< 3	< 0.003
96	BQL	BQL	< 3	< 0.003
168	BQL	BQL	< 3	< 0.003

TARGET LIST ALDEHYDES CHAMBER CONCENTRATIONS, EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS

Elapsed Exposure Hour*	Chamber Concentration µg/m³	Emission Factor µg/m²•hr	Predicted Air Concentration**	
			µg/m³	ppm
0 (Background)	BQL	BQL	---	---
6	107	106	170	0.052
24	60.0	59.8	97	0.027
48	49.4	49.2	75	0.021
72	40.6	40.5	64	0.016
96	34.3	34.1	58	0.015
168	29.4	29.3	47	0.012
Power Law Decay Constant = k_A = 0.377				

*Exposure hours are nominal (± 1 hour).

BQL = Below quantifiable level of 0.04 µg based on a standard 18 L air collection volume for VOCs and 0.1 µg based on a standard 45 L air collection volume for aldehydes.

**Predicted Air Concentrations are based on GREENGUARD modeling predicted concentration parameters. For more information click here.

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TABLE 3

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel

CHAMBER CONCENTRATIONS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS

CAS Number	Compound	Elapsed Exposure Hour (µg/m³)						
		0 (BG)	6	24	48	72	96	168
---	Unresolved hydrocarbons	BQL	63.3	41.3	40.3	39.4	13.4	20.3
39029-41-9	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7-methyl-4-methylene-1-(1-methylethyl)-, (1a,4aa,8aa)-*	BQL	56.1	45.0	38.9	34.3	28.7	28.3
100-52-7	Benzaldehyde	BQL	35.3	22.8	23.8	21.2	19.3	17.3
66-25-1	Hexanal	BQL	24.6	13.3	12.7	10.4	9	7.6
1196-01-6	Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl-, (1S)-*	BQL	18.6	12.7	11.5	10.3	9.5	8
475-20-7	Longifolene	BQL	18.4	12.9	9.1	10.5	8.6	8.5
18252-44-3	(1R,2S,6S,7S,8S)-8-Isopropyl-1-methyl-3-methylenetricyclo[4.4.0.02,7]decane-rel-*	BQL	17.7	13.9	12.3	12.4	9.2	9.3
562-74-3	3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)*	BQL	14.2	6.6	6.9	6.1	5.4	5
76-22-2	Camphor	BQL	13.5	8.6	8.3	7.4	6.4	5.7
629-59-4	Tetradecane†	BQL	12.7	10.4	10.1	9.2	8.1	7.9
629-62-9	Pentadecane	BQL	12.4	11.3	11.2	10.3	9.2	9.4
7785-53-7	3-Cyclohexene-1-methanol, .alpha.,.alpha.,4-trimethyl-, (R)-*	BQL	11.8	8.6	9.1	8.3	7.4	6.8
14905-56-7	Tetradecane, 2,6,10-trimethyl-*	BQL	11.0	8.5	7.4	7.1	6.1	6
3856-25-5	Copaene*	BQL	9.5	6.4	5.8	5.6	4.5	4.4
629-50-5	Tridecane	BQL	8.8	6.4	6.2	5.6	4.6	4.3
80-56-8	Pinene, a (2,6,6-Trimethyl-bicyclo[3.1.1]hept-2-ene)	BQL	8	4.8	3.9	2.5	2.2	
5989-27-5	D-Limonene*	BQL	7.7	5.8	5.9	4.2	3.2	2.1
71-36-3	1-Butanol (N-Butyl alcohol)†	BQL	7.6	4.6	4.7	4	3.5	2.5
7787-20-4	Bicyclo[2.2.1]heptan-2-one, 1,3,3-trimethyl-, (1R)-*	BQL	7.3	4	4.1	3.8	2.9	2.7
1193-18-6	2-Cyclohexen-1-one, 3-methyl-*	BQL	6.6	4.1	4.2	3.8	3.2	2.9
71-41-0	1-Pentanol (N-Pentyl alcohol)	BQL	6.3	3.6	3.6	3	2.8	2.4
---	Hydrocarbons	BQL	6.2	4.6	5.2	4.5	4.1	4.2
105191-67-1	12-Oxatetracyclo[4.3.1.1(2,5).1(4,10)]dodecane, 11-isopropylidene-*	BQL	5.6	4	4.4	4.5	3.5	3.7
1559-81-5	Naphthalene, 1,2,3,4-tetrahydro-1-methyl	BQL	5.4	3.5	3.5	3.2	2.4	2.4
25360-09-2	tert-Hexadecanethiol*	BQL	5	3.8	3.6	3.4	2.7	2.8
14912-44-8	Ylangene*	BQL	4.6	3.4	3.1	2.8	2.1	2.2
73209-42-4	trans-Calamenene*	BQL	4.5	3.8	6.2	3.3	2.5	2.9
77171-55-2	(-)-Spathulenol*	BQL	4.3					
124-19-6	Nonyl aldehyde (Nonanal)†	BQL	4.2	2.7	2.7	2.8	2.2	

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Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel

CHAMBER CONCENTRATIONS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS

CAS Number	Compound	Elapsed Exposure Hour (µg/m³)						
		0 (BG)	6	24	48	72	96	168
110-62-3	Pentanal	BQL	3.8					
112-40-3	Dodecane†	BQL	3.7	2.4	2.4	2.1		
108-88-3	Toluene (Methylbenzene)	BQL	3.7					
124-13-0	Octanal†	BQL	3.6	2.2	2.3	2.3		
138-87-4	Cyclohexanol, 1-methyl-4-(1-methylethenyl)-*	BQL	3.1	2	2.1	2		
111-71-7	Heptanal (Heptaldehyde)†	BQL	2.9					
111-27-3	1-Hexanol (N-Hexyl alcohol)	BQL	2.6					
13040-03-4	(1R)-cis-Verbenol*	BQL	2.5					
91253-94-0	2-Naphthol, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-*	BQL	2.5					
1632-73-1	Bicyclo[2.2.1]heptan-2-ol, 1,3,3-trimethyl*	BQL	2.4					
7206-13-5	2-Dodecene, (E)	BQL	2.2					
66964-63-4	(3R,3aR,5R,6R,7aR)-3,6-Dimethyl-5-(prop-1-en-2-yl)-6-vinylhexahydrobenzofuran-2(3H)-one*	BQL	2.1					
3777-69-3	Furan, 2-pentyl	BQL	2.1					
1000189-03-6	3-(1,5-Dimethyl-hex-4-enyl)-2,2-dimethyl-cyclopent-3-enol*	BQL		2.7				
507-70-0	Borneol (endo-Borneol)*	BQL		3	2.9	2.8	2.3	2.1
55282-12-7	Octadecane, 3-ethyl-5-(2-ethylbutyl)-*	BQL		2.7	2.5	2.5		2.2

*Indicates NIST/EPA/NIH best library match only based on retention time and mass spectral characteristics.

†Denotes quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

Quantifiable level is 0.04 µg based on a standard 18 L air collection volume.

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TABLE 4

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel

EMISSION FACTORS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS

CAS Number	Compound	Elapsed Exposure Hour (µg/m²•hr)					
		6	24	48	72	96	168
---	Unresolved hydrocarbons	63.0	41.2	40.1	39.2	13.4	20.2
39029-41-9	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7-methyl-4-methylene-1-(1-methylethyl)-, (1a,4aa,8aa)-*	55.8	44.8	38.7	34.2	28.6	28.2
100-52-7	Benzaldehyde	35.1	22.7	23.7	21.1	19.3	17.2
66-25-1	Hexanal	24.5	13.2	12.6	10.3	9	7.6
1196-01-6	Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl-, (1S)-*	18.5	12.7	11.5	10.2	9.4	8
475-20-7	Longifolene	18.3	12.9	9.1	10.5	8.5	8.4
18252-44-3	(1R,2S,6S,7S,8S)-8-Isopropyl-1-methyl-3-methylenetricyclo[4.4.0.02,7]decane-rel-*	17.6	13.8	12.2	12.4	9.2	9.3
562-74-3	3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)*	14.1	6.6	6.9	6.1	5.4	5
76-22-2	Camphor	13.5	8.6	8.3	7.4	6.4	5.7
629-59-4	Tetradecane†	12.6	10.3	10.1	9.1	8.1	7.8
629-62-9	Pentadecane	12.4	11.2	11.2	10.2	9.2	9.4
7785-53-7	3-Cyclohexene-1-methanol, .alpha.,.alpha.,4-trimethyl-, (R)-*	11.7	8.6	9.1	8.2	7.3	6.8
14905-56-7	Tetradecane, 2,6,10-trimethyl-*	11.0	8.5	7.3	7.1	6.1	6
3856-25-5	Copaene*	9.4	6.4	5.8	5.6	4.5	4.3
629-50-5	Tridecane	8.8	6.3	6.2	5.5	4.6	4.3
80-56-8	Pinene, a (2,6,6-Trimethyl-bicyclo[3.1.1]hept-2-ene)	8	4.8	3.8	2.5	2.2	
5989-27-5	D-Limonene*	7.7	5.8	5.9	4.2	3.2	2.1
71-36-3	1-Butanol (N-Butyl alcohol)†	7.5	4.6	4.7	3.9	3.5	2.5
7787-20-4	Bicyclo[2.2.1]heptan-2-one, 1,3,3-trimethyl-, (1R)-*	7.3	4	4.1	3.8	2.9	2.7
1193-18-6	2-Cyclohexen-1-one, 3-methyl-*	6.6	4	4.2	3.8	3.2	2.9
71-41-0	1-Pentanol (N-Pentyl alcohol)	6.3	3.6	3.6	3	2.8	2.4
---	Hydrocarbons	6.2	4.6	5.2	4.5	4.1	4.2
105191-67-1	12-Oxatetracyclo[4.3.1.1(2,5).1(4,10)]dodecane, 11-isopropylidene-*	5.6	4	4.4	4.4	3.5	3.7
1559-81-5	Naphthalene, 1,2,3,4-tetrahydro-1-methyl	5.4	3.5	3.5	3.2	2.4	2.4
25360-09-2	tert-Hexadecanethiol*	5	3.8	3.6	3.4	2.7	2.8
14912-44-8	Ylangene*	4.6	3.4	3.1	2.8	2.1	2.2

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EMISSION FACTORS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS

CAS Number	Compound	Elapsed Exposure Hour (µg/m²•hr)					
		6	24	48	72	96	168
73209-42-4	trans-Calamenene*	4.4	3.8	6.2	3.2	2.5	2.9
77171-55-2	(-)-Spathulenol*	4.3					
124-19-6	Nonyl aldehyde (Nonanal)†	4.2	2.7	2.7	2.8	2.1	
110-62-3	Pentanal	3.8					
112-40-3	Dodecane†	3.7	2.4	2.4	2.1		
108-88-3	Toluene (Methylbenzene)	3.7					
124-13-0	Octanal†	3.6	2.2	2.3	2.3		
138-87-4	Cyclohexanol, 1-methyl-4-(1-methylethenyl)-*	3.1	2	2.1	2		
111-71-7	Heptanal (Heptaldehyde)†	2.9					
111-27-3	1-Hexanol (N-Hexyl alcohol)	2.6					
13040-03-4	(1R)-cis-Verbenol*	2.5					
91253-94-0	2-Naphthol, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-*	2.5					
1632-73-1	Bicyclo[2.2.1]heptan-2-ol, 1,3,3-trimethyl*	2.4					
7206-13-5	2-Dodecene, (E)	2.2					
66964-63-4	(3R,3aR,5R,6R,7aR)-3,6-Dimethyl-5-(prop-1-en-2-yl)-6-vinylhexahydrobenzofuran-2(3H)-one*	2.1					
3777-69-3	Furan, 2-pentyl	2.1					
1000189-03-6	3-(1,5-Dimethyl-hex-4-enyl)-2,2-dimethyl-cyclopent-3-enol*		2.7				
507-70-0	Borneol (endo-Borneol)*		3	2.9	2.8	2.3	2.1
55282-12-7	Octadecane, 3-ethyl-5-(2-ethylbutyl)-*		2.7	2.4	2.5		2.2

*Indicates NIST/EPA/NIH best library match only based on retention time and mass spectral characteristics.

†Denotes quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

Quantifiable level is 0.04 µg based on a standard 18 L air collection volume.

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TABLE 5

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel

CHAMBER CONCENTRATIONS OF TARGET LIST ALDEHYDES

CAS Number	Compound	Elapsed Exposure Hour (µg/m³)						
		0 (BG)	6	24	48	72	96	168
4170-30-3	2-Butenal	BQL	BQL	BQL	BQL	BQL	BQL	BQL
75-07-0	Acetaldehyde	BQL	**18.0**	**4.3**	**3.3**	**3.1**	**3**	**2.7**
100-52-7	Benzaldehyde	BQL	**33.2**	**24.0**	**20.4**	**18.7**	**16.2**	**15.3**
5779-94-2	Benzaldehyde, 2,5-dimethyl	BQL	BQL	BQL	BQL	BQL	BQL	BQL
529-20-4	Benzaldehyde, 2-methyl	BQL	BQL	BQL	BQL	BQL	BQL	BQL
620-23-5 / 104-87-0	Benzaldehyde, 3- and/or 4-methyl	BQL	BQL	BQL	BQL	BQL	BQL	BQL
123-72-8	Butanal	BQL	**2.2**	BQL	BQL	BQL	BQL	BQL
590-86-3	Butanal, 3-methyl	BQL	BQL	BQL	BQL	BQL	BQL	BQL
50-00-0	Formaldehyde	BQL	**2.9**	**2**	**2.2**	BQL	BQL	BQL
66-25-1	Hexanal	BQL	**32.3**	**21.2**	**16.3**	**13.7**	**12.9**	**11.4**
110-62-3	Pentanal	BQL	**7.3**	**3.6**	**2.2**	BQL	BQL	BQL
123-38-6	Propanal	BQL	BQL	BQL	BQL	BQL	BQL	BQL

TABLE 6

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel

EMISSION FACTORS OF TARGET LIST ALDEHYDES

CAS Number	Compound	Elapsed Exposure Hour (µg/m²•hr)					
		6	24	48	72	96	168
4170-30-3	2-Butenal	BQL	BQL	BQL	BQL	BQL	BQL
75-07-0	Acetaldehyde	**17.9**	**4.3**	**3.3**	**3.1**	**3.0**	**2.7**
100-52-7	Benzaldehyde	**33.1**	**23.9**	**20.3**	**18.6**	**16.1**	**15.2**
5779-94-2	Benzaldehyde, 2,5-dimethyl	BQL	BQL	BQL	BQL	BQL	BQL
529-20-4	Benzaldehyde, 2-methyl	BQL	BQL	BQL	BQL	BQL	BQL
620-23-5 / 104-87-0	Benzaldehyde, 3- and/or 4-methyl	BQL	BQL	BQL	BQL	BQL	BQL
123-72-8	Butanal	**2.2**	BQL	BQL	BQL	BQL	BQL
590-86-3	Butanal, 3-methyl	BQL	BQL	BQL	BQL	BQL	BQL
50-00-0	Formaldehyde	**2.9**	**2.0**	**2.2**	BQL	BQL	BQL
66-25-1	Hexanal	**32.2**	**21.1**	**16.2**	**13.6**	**12.9**	**11.4**
110-62-3	Pentanal	**7.3**	**3.6**	**2.2**	BQL	BQL	BQL
123-38-6	Propanal	BQL	BQL	BQL	BQL	BQL	BQL

BQL = Below quantifiable level of 0.1 µg based on a standard 45 L air collection volume.

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TABLE 7

SUPPLEMENTAL EMISSIONS INFORMATION

The table below represents this product's identified chemical emissions found on certain regulatory lists. This list only provides a statement regarding possible health effects associated with this compound and not the relative risks of exposure. Proper interpretation of the risks associated with exposure to a given regulated compound requires a more detailed evaluation of toxicological activity. Certain purchasing programs may require this information be submitted.

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel						
CAS Number	**Compound**	**✓() = FOUND IN LISTING (CLASS)**					
		CAL PROP. 65	**NTP**	**IARC**	**CAL AIR TOXICS**	**CREL**	**TLV**
71-36-3	1-Butanol (N-Butyl alcohol)†				✓(IVB)		✓
75-07-0	Acetaldehyde	✓(1)	✓(2B)	✓(2B)	✓(IIA)	✓	✓
76-22-2	Camphor						✓
5989-27-5	D-Limonene			✓(3)			
50-00-0	Formaldehyde	✓(1)	✓(2A)	✓(1)	✓(IIA)	✓	✓
110-62-3	Pentanal						✓
80-56-8	Pinene, a (2,6,6-Trimethyl-bicyclo[3.1.1]hept-2-ene)						✓
108-88-3	Toluene (Methylbenzene)	✓(2)		✓(3)	✓(IIA)	✓	✓

†Denotes quantified using multipoint authentic standard curve

CAL Prop. 65: California Health and Welfare Agency, Proposition 65 Chemicals
1 = known to cause cancer
2 = known to cause reproductive toxicity

NTP: National Toxicology Program
2A = known to be carcinogenic to humans
2B = reasonably anticipated to be carcinogenic to humans

IARC: International Agency on Research of Cancer
1 = carcinogenic to humans
2A = probably carcinogenic to humans
2B = possibly carcinogenic to humans
3 = unclassifiable as to carcinogenicity to humans
4 = probably not carcinogenic to humans

California Air Toxics
I = Substances identified as Toxic Air Contaminants, known to be emitted in California, with a full set of health values reviewed by the Scientific Review Panel.
IIA = Substances identified as Toxic Air Contaminants, known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel.
IIB= Substances NOT identified as Toxic Air Contaminants, known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel.
III = Substances known to be emitted in California and are NOMINATED for development of health values or additional health values.
IVA = Substance identified as Toxic Air Contaminants, known to be emitted in California and are TO BE EVALUATED for entry into Category III.
IVBA =Substance NOT identified as Toxic Air Contaminants, known to be emitted in California and are TO BE EVALUATED for entry into Category III.
V = Substance identified as Toxic Air Contaminants, and NOT KNOWN TO BE EMITTED from stationary source facilities in California based on information from the AB 2588 Air Toxic "Hot Spots" Program and the California Toxic Release Inventory.
VI = Substances identified as Toxic Air Contaminants, NOT KNOWN TO BE EMITTED from stationary source facilities in California, and are active ingredients in pesticides in California.

CREL: California Office of Environmental Health's Hazard Assessment (OEHHA), Chronic Reference Exposure Levels
✓ = Found in Listing

ACGIH TLV American Conference of Governmental Industrial Hygienists Threshold Limit Values for Chemical Substances and Physical Agents.
✓ = Found in Listing.

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CHAIN OF CUSTODY

2536122

Description: Nevpanel Magnesium Oxide Based Insulation and Construction Panel

Customer: NEVPANEL YAPI MADEN URETIM ITH
Received Date: 2019-OCT-17 02:29:56 PM
Aurora Project No.: 1000780313
Order No.: 13027655
Oracle Project No.:

1 of 3

CUTHBM409

INTERNAL Use Only			
Project #	1000780313		
Product #	2536122		
Order #	13027655		
Task Line	1.1	UL BU	
____ of ____			

☐ *Rush Request – Subject to upcharge. Customer must confirm with UL prior to submitting product.*

GREENGUARD Test Information

Test Type	☒ Certification Test - Annual/Initial Year 5			☐ Out-of-Scope Test	
	☐ Quarterly Test - Year Quarter			☐ Profile Study Test	
Service Line	☒ GREENGUARD	☒ GREENGUARD GOLD	☐ Other		
Test Group	Magnesium Oxide Boards - 01				
Product Category	Building Construction Materials		Subcategory		
Application	☐ Floor/Ceiling	☐ Panel	☐ Wall	☐ Work Surface	☐ Other:
Wet Products Only	Coverage Rate		Density		Specific Gravity

Product and Company Information

Product Description	Nevpanel® Magnesium Oxide Based Insulation and Construction Panel		
Manufacture ID#	~~20181128-12/4 pcs~~ 18/4 pcs		
Company Name	Nevpanel Yapi Maden Uretim Ith.Ihr.San. ve Tic.Ltd	Date Manufactured	11/26/2018
		Contact Name	Elif Sen
Address	Bagdat Caddesi Colakoglu Ismerkezi	Job Title	Export Manager
	No 458-30	Contact Phone	00902164573600
	Maltepe Istanbul Turkiye	Contact Email	elif@nevra.com.tr

Collection Information

Collector Name	Ercan Ozsoy	Date Collected	10/15/2019
Collector Phone	00222 236 0000	Time Collected	11:30
Collector Signature		Collection Location	Eskişehir Factory

Shipping Information

Carrier	DHL		
Shipper Name		Date Shipped	10/15/2019
Shipper Phone		Time Shipped	12:40
Shipper Signature		Air Bill #	5750821521

Sample Submitted to

☒ UL Environment (Marietta) 2211 Newmarket Pkwy Suite 106 Marietta, GA 30067, USA	☐ UL Verification Services (Guangzhou) Building A1, 3F, Nansha Science and Technology Innovation Ctr. No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China	☐ UL International Italia S.r.l ATTN: IAQ Laboratory Via Europa, 9 I – 22060 – Cabiate (Como), Italia	☐ Other

Post Testing Sample Disposition
(Sample will be disposed of 30 days after report is issued if information below is not provided)

Return Shipping Co.		Customer Shipping Acct #	

Internal Use Only – Receiving Information

Receiver Name				Receiver Signature	
Condition Upon Arrival	☒ Acceptable	☐ Not Acceptable		Receive Date	10/17/19
Condition Notes				Receive Time	12:29 PM
Completed By	ULE	Based On	Program Testing Schedule	Date	

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APPENDIX 1

GREENGUARD GOLD RESULTS SUMMARY

Product Description	Nevpanel Magnesium Oxide Based Insulation and Construction Panel			
COMPLIANCE WITH GREENGUARD GOLD STANDARD				
GREENGUARD Gold Acceptable IAQ Criteria		**168 Hour Predicted Concentration****		**Product Compliance for IAQ**
		Office	**Classroom**	
TVOC	**≤ 0.22 mg/m³**	0.18 mg/m³††	0.093 mg/m³	Yes
Formaldehyde	**≤ 0.0073 ppm**	< 0.003 ppm	< 0.001 ppm	Yes
Total Aldehydes	**≤ 0.043 ppm**	0.013 ppm	0.004 ppm	Yes
1-Methyl-2-Pyrrolidinone	**≤ 0.16 mg/m³**	< 0.003 mg/m³	< 0.001 mg/m³	Yes
Individual VOCs	**≤ 1/100 TLV and ≤ ½ chronic REL**	See Below		

**Predicted Air Concentrations are based on GREENGUARD Gold modeling predicted concentration parameters.

††336 predicted concentration.

TOP TEN MOST ABUNDANT IDENTIFIED VOCS, INCLUDING ALDEHYDES					
CAS Number	**Compound**	**168 Hour Chamber Concentration (µg/m³)**	**168 Hour Emission Factor (µg/m²•hr)**	**Predicted Air Concentration** (µg/m³)**	
				Office	**Classroom**
39029-41-9	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-7-methyl-4-methylene-1-(1-methylethyl)-, (1a,4aa,8aa)-*	28.3	28.2	45	14
---	Unresolved hydrocarbons	20.3	20.2	32	10
100-52-7	Benzaldehyde‡	17.3	17.2	28	9
66-25-1	Hexanal‡	11.4	11.4	18	6
629-62-9	Pentadecane	9.4	9.4	15	5
18252-44-3	(1R,2S,6S,7S,8S)-8-Isopropyl-1-methyl-3-methylenetricyclo[4.4.0.02,7]decane-rel-	9.3	9.3	15	5
475-20-7	Longifolene	8.5	8.4	13	4
1196-01-6	Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl-, (1S)-	8	8	13	4
629-59-4	Tetradecane †	7.9	7.8	13	4
7785-53-7	3-Cyclohexene-1-methanol, .alpha.,.alpha.,4-trimethyl-, (R)-	6.8	6.8	11	3

[a]American Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents. Cincinnati, OH: ACGIH.

[b]Chronic Reference Exposure Levels (CRELs) adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA).

†Denotes quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

‡Indicates compound identified and quantified by DNPH derivitization and HPLC/UV analysis with multipoint authentic standard.

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*Identification based on NIST mass spectral database only.

**Predicted Air Concentrations are based on modeling predicted concentration parameters shown above.

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CHEMICALS OF CONCERN WITH EXISTING TLV, CREL, CA PROP 65 OR CAL TOXIC AIR CONTAMINANT VALUES									
CAS Number	Compound	168 Hour Chamber Concentration (µg/m³)	168 Hour Emission Factor (µg/m²•hr)	168 Hour Predicted Concentration** (µg/m³)		✓ INDICATES PRESENCE ON LIST			
				Office	Classroom	CA PROP 65	CA TAC	CA CREL	ACGIH TLV
71-36-3	1-Butanol (N-Butyl alcohol)†	2.5	2.5	4	1		✓(IVB)		✓
75-07-0	Acetaldehyde‡	2.7	2.7	4	1	✓(1)	✓(IIA)	✓	✓
76-22-2	Camphor	5.7	5.7	9	3				✓

COMPARISON OF COMPOUNDS FOUND WITH EXISTING TLV AND/OR CHRONIC REL						
CAS Number	Compound	1/100 TLV[a] (µg/m³)	½ CA Chronic REL[b] (µg/m³)	168 Hour Predicted Concentration** (µg/m³)		Product Compliance
				Office	Classroom	
71-36-3	1-Butanol (N-Butyl alcohol)	606	---	4	1	Yes
75-07-0	Acetaldehyde	450	70	4	1	Yes
76-22-2	Camphor	125	---	9	3	Yes

[a]American Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents. Cincinnati, OH: ACGIH.

[b]Chronic Reference Exposure Levels (CRELs) adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA).

†Denotes quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.

‡Indicates compound identified and quantified by DNPH derivitization and HPLC/UV analysis with multipoint authentic standard.

*Identification based on NIST mass spectral database only.

**Predicted Air Concentrations are based on modeling predicted concentration parameters shown above.