CONSTRUCTING THE FUTURE

US Murotech is a pre-manufactured wall that contains 50% cement, EPS, Foam (engineering polymers), clays, and it is coated with two layers of calcium silicate, one on each side. Murotech has advantages that no other building product can offer. Since it has different variations according to size, function, and needs which makes US MUROTECH a flexible product to use

MISSION

Our mission is to leave society a great legacy: to establish new construction systems in accordance with the present, sustainability and technology, and thereby provide great benefits for modern society: such as speed in construction, simplicity in construction process, and thus make a great contribution to the ecological aspect. Our innovative system is compatible and perfectly recommended for the construction of schools, hospitals, public buildings, adjoining walls, housing, commercial spaces and much more. Our fundamental purpose is to transform current construction systems and migrate to modern construction, which benefits for society are of great value.

VISION

Our qualities are adjusted to the needs of modernity, clean and ecological construction that does not require polluting processes, contributes to the sustainability of buildings, which translates into benefits in the short, medium and long term. Our vision of the future is to create construction that reaches the largest possible part of society. Based not only on the total quality with which we currently work, but also motivating and promoting good practices and corporate actions for permanent innovation and continuous improvement.

CORE VALUES

We work under the highest business values, in relation to ethics towards our clients and our employees. The team of technicians, administrators and collaborators that we have formed, is convinced that the work done with responsibility, professionalism and quality, is what maintains the value of our company. We foster a culture of innovation and continuous improvement. In addition to the values of commitment, punctuality and flexibility and a high sense of responsibility. We seek in the attitude of our collaborators, proactivity, teamwork and a positive attitude.

PANEL BENEFITS

SAFETY

- Non-toxic and completely inert
- Does not contain chlorofluorocarbons orhydrofluorocarbons.
- Non-health-hazardous during
- installation
- The dust generated does not harm the respiratory tract
- Does not affect the ozone layer

PERMEABILITY MOISTURE AND RESISTANCE

- Permeability and humidity resistant
- MUROTECH® counts with a permeability of 0.001%, meeting national and international humidity and water resistance standards.
- During laboratory tests, it was demonstrated that water containers could be made with MUROTECH® without finding traces of filtration or having the need to add another additive

PANEL BENEFITS

FIRE RETARDANT

- The 0.17"outer layer of each MUROTECH® acts as a fireproof barrier
- Each panel can withstand a total of four hours ar 1832F
- The materials that compose MUROTECH® do not release toxic gases and they comply with the international protections standards.

ACOUSTIC INSULATOR

- MUROTECH® meets the criteria for acoustic insulations needed between two rooms or between two houses.
- During the laboratory tests, it was found that the material used in MUROTECH® to retain heat over preformed as it also worked as an acoustic insulator. It has a 47 db (decibels) insulation compared to a batt insulated drywall which has 33db.

SPACE AND COST:

- Space saving: EPS and polymer alloy with concrete (MUROTECH®) with a thickness of 2.32in-3.5in. It is a new, thin,and solid material that in every type of construction would save a big amount of construction space compared to convencional block.
- Labour work saving: With MUROTECH® building is practical and simple. Building with 35% less time than usual.
- Cost saving: Due to MUROTECH® weight, of only 1/12 of the traditional block, it will save 1⁄3 from the construction structure

ANTISALITRE:

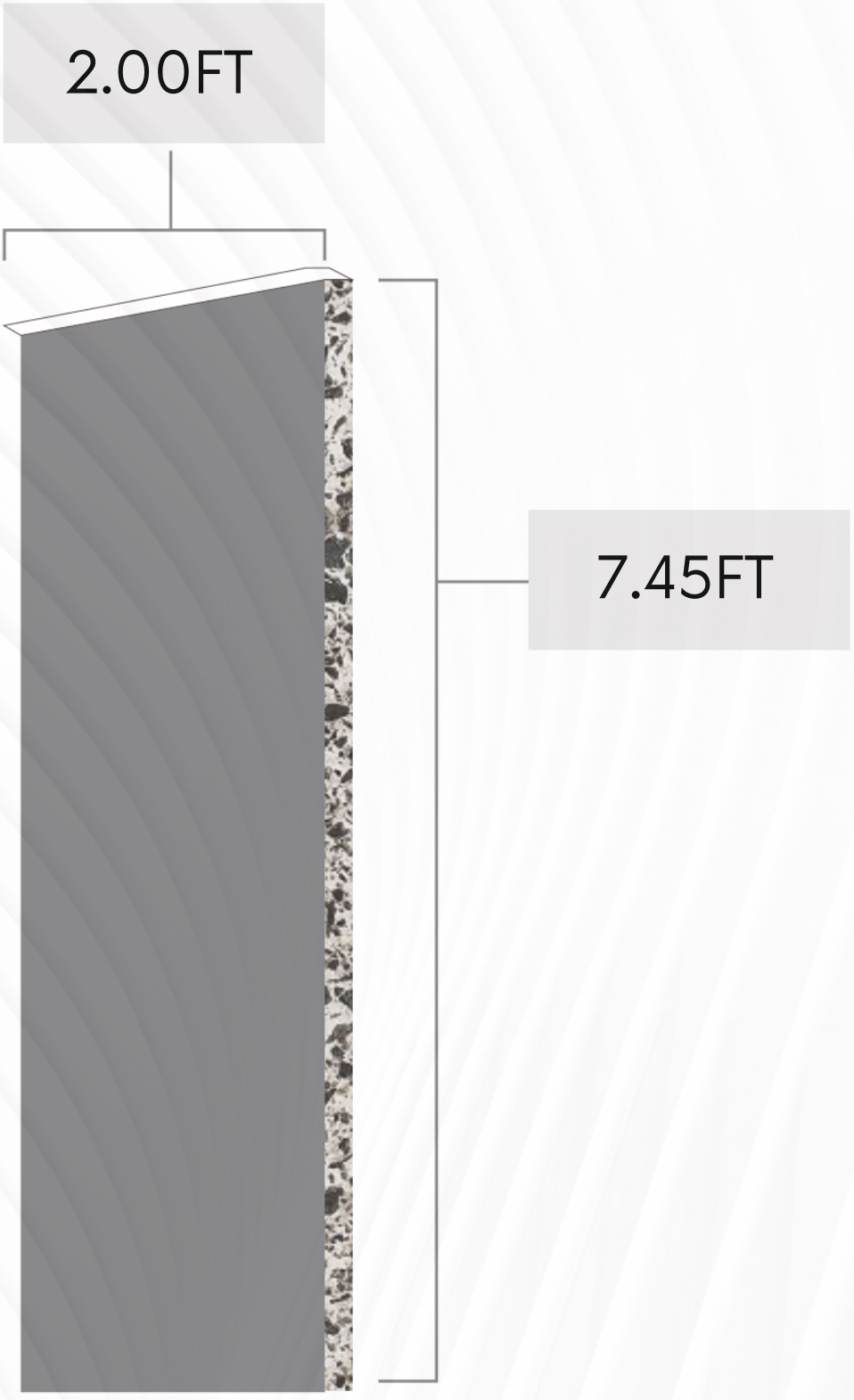
- Does not rut, rust, or decompose
- Maintains structural strength
- Completely absent of any nutritional value for insects
- Resist termites, other insects and rodents.

MINIMUM WASTE

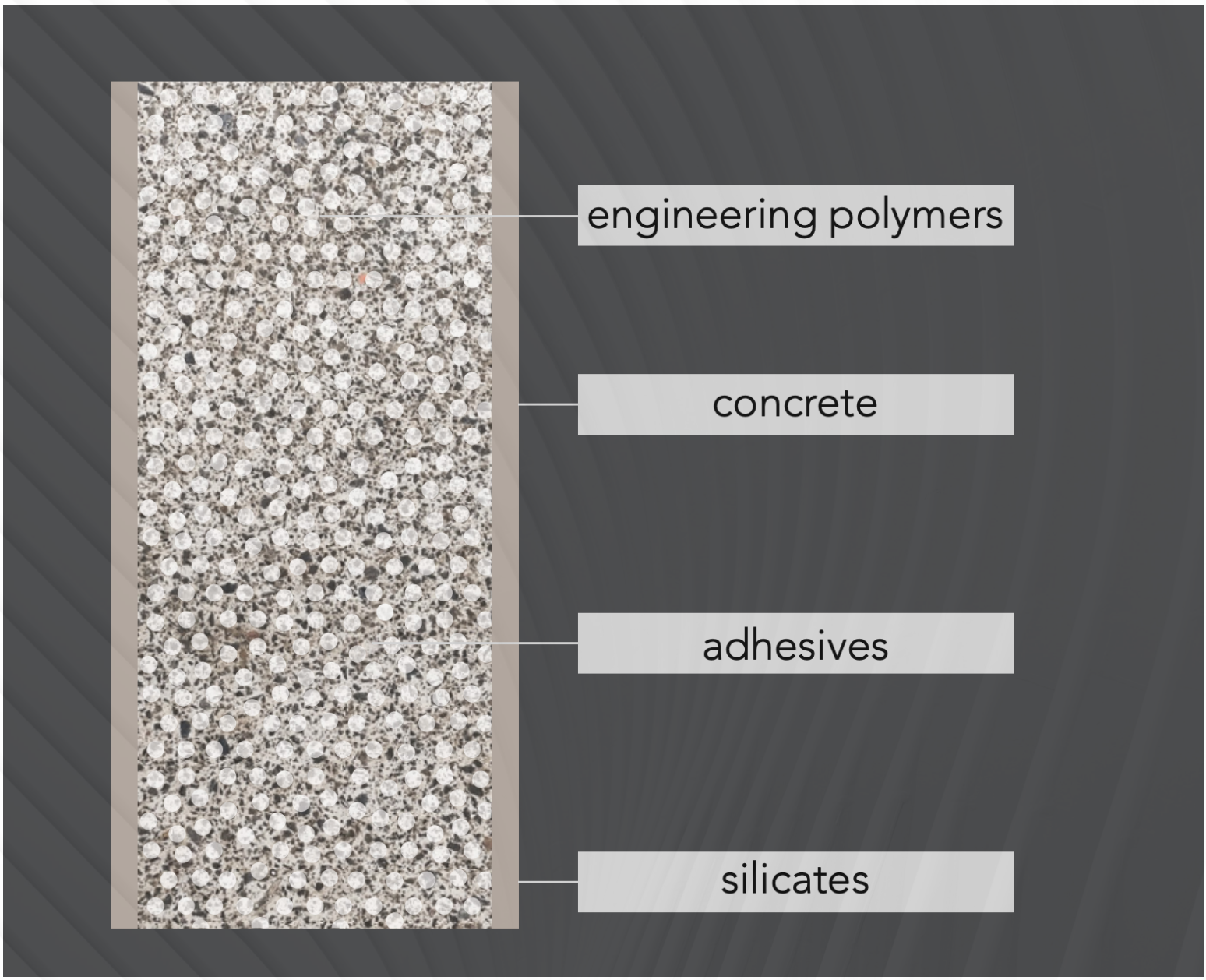
- Simplify the framing, isolation and coating of a process.
- Faster construction cycle reduces workforce

PRACTICAL INSTALATION

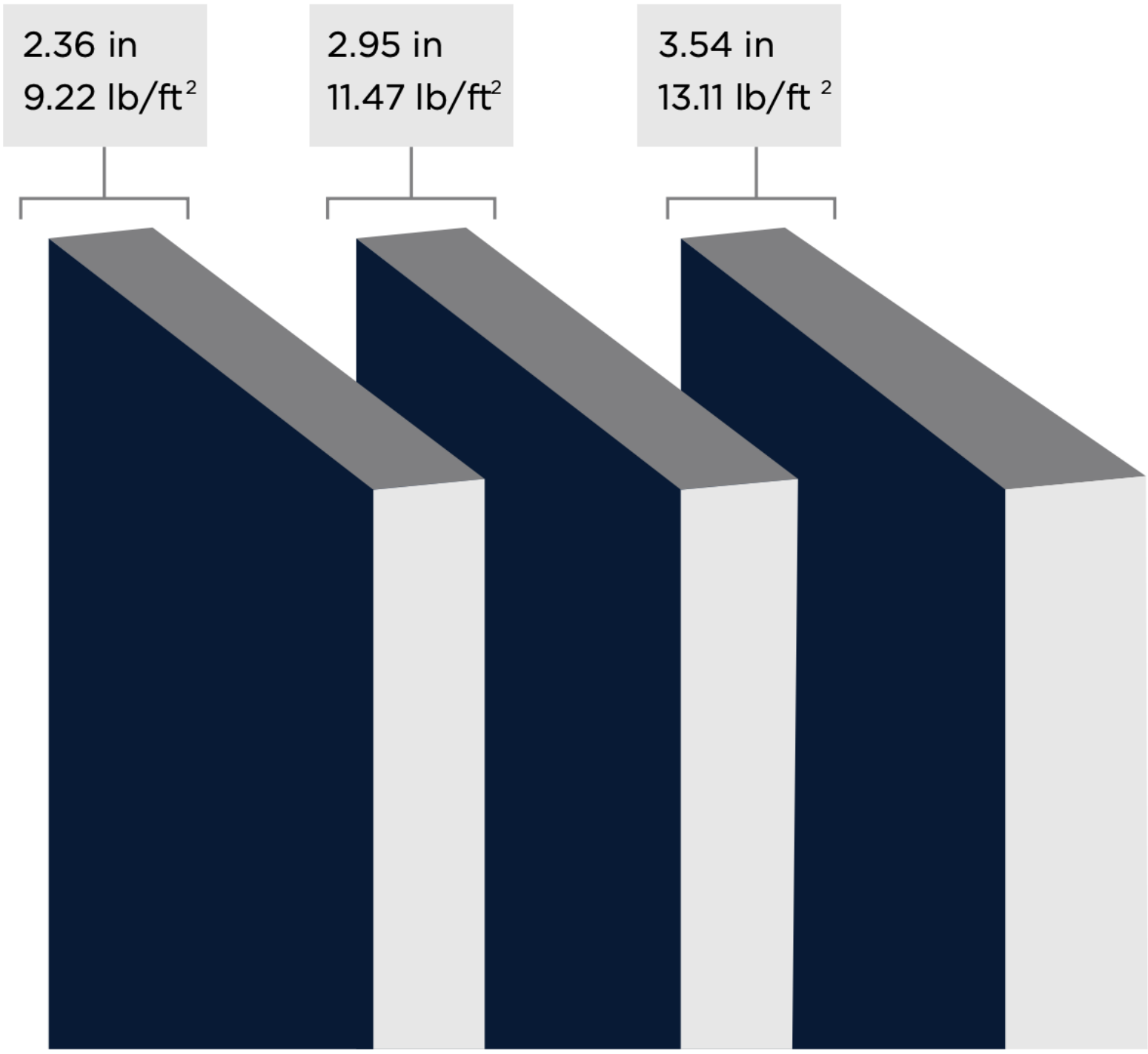
- Due to its advantage, MUROTECH® can build a 2,150 sq2 space in just 15 to 20 days.



STANDARD DIMENSIONS



A MUROTECH FROM INSIDE



DIMENSIONS / WEIGHT / THICKNESS

LABORATORY TESTS

	Thickness 2.36in	Thickness 3.54in
Quality and dimension variations	d1=0	d1=0
Surface density	11.53 psf	14.99 psf
Anti-pressure force	797.71 psi	1189.31 psi
Humidity rate	3.60%	4.40%
Soften coefficient	0.80	0.85
Time it takes to load anti-damage flexion/plus deadlift	3 times (no damage)	3 times (no damage)
Anti-resistance to impact	No transversal crack in Murotech	No transversal crack in Murotech
Single point of pendant strength	No transversal crack in Murotech	No transversal crack in Murotech
Fireproof limits	4 hours	4 hours
Heat transference	0.1478 W / (MK)	0.1478 W / (MK)
Drying shrinkage value	0.3	0.3
Exposure index for internal radiation	0.1	0.1
Exposure index for external radiation	0.2	0.1

imcyc®

UAG Universidad Autónoma de Guadalajara®

CIDI Centro de Investigación para el Desarrollo Industrial

MOLD TEST RESULTS

Conclusions

The Murotech product was found to be resistant to fungal with no visible growth after the 4 week challenge test.

References

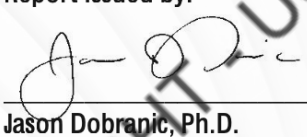
D 3273 – 00 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

Signatures

Study Performed by:

Mona Ramadi, Ph.D.
Microbiologist

Report Issued by:



Jason Dobranic, Ph.D.
Vice President of Microbiology & Life Sciences
Study Director

ASTM D570 WATER ABSORPTION RESULTS

EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 858-4800

EMSL Order ID:	362002876
Sample(s) Received:	11/6/2020
Date of Reporting:	11/27/2020
Date Printed:	11/27/2020
Reported By:	D. Macready

Average of Results:

EMSL Sample ID:	362002876-0001, 362002876-0002, 362002876-0003	
Customer Sample Number:	1,2,3	
Customer Sample Description:	Murotech panel 2x2	
Parameter	Value (wt%)	Conditions
Percentage Increase in Weight During Immersion	18.06	24 Hour Immersion 23°C
Percentage of Soluble Matter Lost During Immersion	0.00	24 Hour Immersion 23°C
Percentage of Water Absorbed	18.06	24 Hour Immersion 23°C

R VALUE TEST RESULTS

4. Final Result

Next, the thermal conductivity of MUROTECH, the tests of the 3 samples is presented, as well as the variables resulting from the tests

THERMAL CONDUCTIVITY OF MUROTECH

Variable	VALUE
Thermal conductivity (W/m K)	**0.3255**
Thermal resistance (m²K/W)	0.2435
Thickness (m)	0.0899
EPCG mean working temperature (°C)	38.39

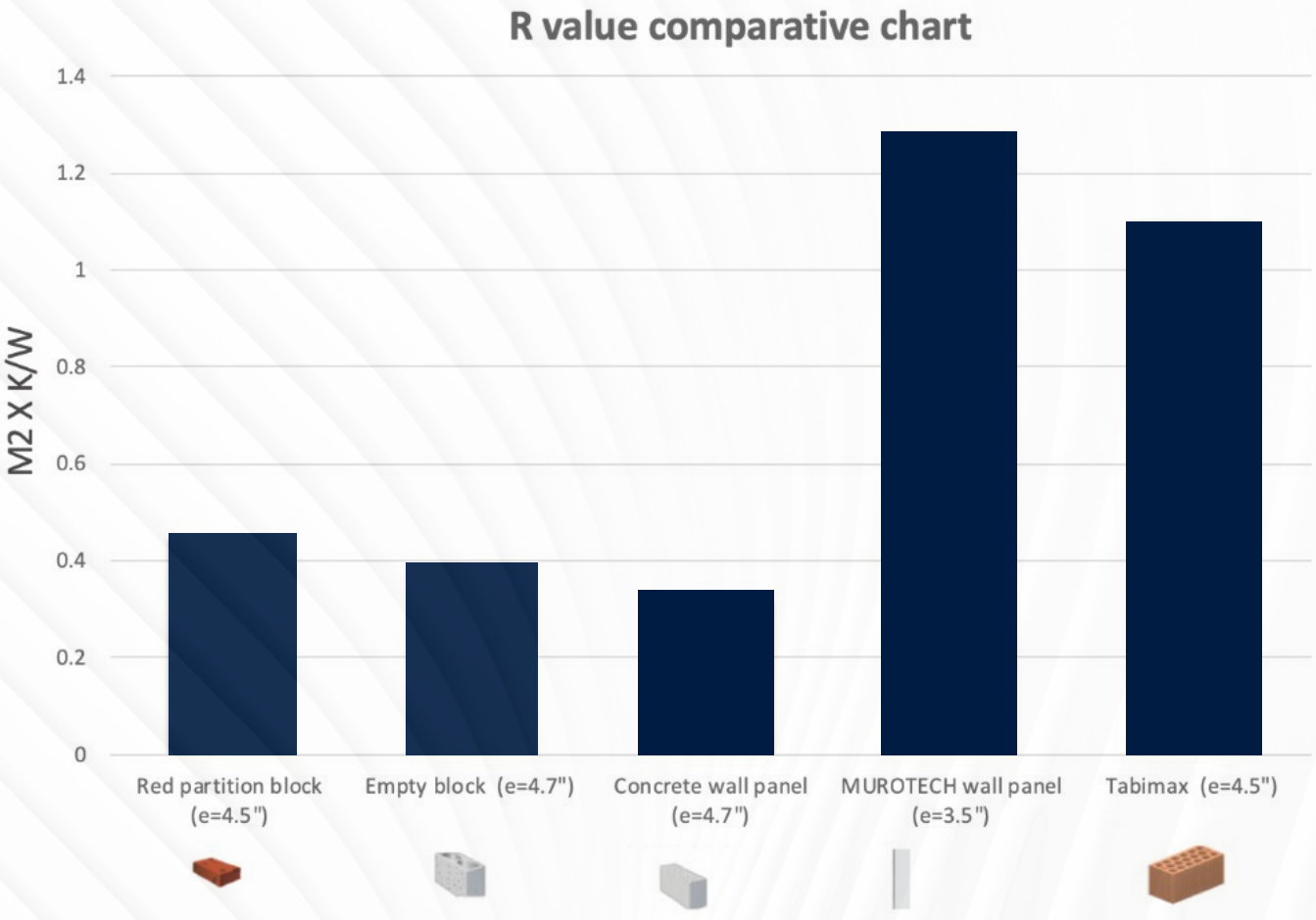
Experimental value

Variable	Average value
Hot plate temperature (°C)	52.05
Cold plate temperature(°C)	24.73
Temperature gradient in the sample (°C)	27.31
Measurement area (m²)	0.128
Supplied power (W)	104.18

Values by samples and tests

Sample and trial number		Apparent thermal conductivity (W/m K)
Sample 1	M1-E1	0.3251
	M1-E2	0.3169
	M1-E3	0.3113
	Average	0.3177
Sample 2	M2-E1	0.319
	M2-E2	0.3218
	M2-E3	0.3166
	Average	0.3191
Sample 3	M3-E1	0.3484
	M3-E2	0.3365
	M3-E3	0.3347
	Average	0.3398
VALOR FINAL		0.3255

VALUE COMPARISON R VALUES



R value is calculated with flattened and internal and external surface resistance

M. ING. VALERIA SALAS

SIMPLE COMRESSION

Murotech structural elements (Fabricated in cement, EPS, foam, sand,and covered in calcium silicate sheets)		Complementary Technical Standards for Construction And Design of Masonry Structures for Guadalajara 1997			
Thickness (in)	Resistance to compression	Annealed clay parition wall	Concrete parition wall	Concrete block	Vertical gaps in parition wall
2.95 in	418.17 psi	142.23 psi	142.23 psi	142.23 psi	142.23 psi
3.54 in	401.09 psi				

The specimens were tested as stipulated in the "Complementary technical standards for construction and design of masonry structures," of the construction regulations for the Mexican Federal district.

On the NMX-C-083- ONNCCE-2014 norm determining the resistance to compression of specimens.

RESISTANCE TO FLEXION

Sample	Specimen	Test Done	Dimensions			Maximum Force	Maximum Effort	Maximum Effort
			Clear LC	Width	Thickness	(psi)	(psi)	(psi)
1	1	Flexion	7.40 in	2.39 in	2.38 in	227.27 psi	288.77 psi2	84.47 psi
	2		7.40 in	2.38 in	2.38 in	234.67 psi	299.79 psi2	98.69 psi
1	1	Flexion	9.29 in	2.89 in	2.91 in	140.98 psi	124.44 psi1	28.01 psi
	2		9.29 in	2.93 in	2.90 in	220.17 psi	193.19 psi1	99.13 psi
1	1	Flexion	10.67 in	3.57 in	3.53 in	518.8 psi	289.06 psi2	84.47 psi
	2		10.67 in	3.55 in	3.55 in	500.09 psi	278.47 psi2	84.47 psi

Resistance to flexion by punctual load to the center of the calcium silicate sheet, using a load transmitter with a plate of specified dimensions.

The specimens were tested as stipulated on the ASTM standards with designation: C293-02. The standard test for Flexural strength of concrete (Using a single beam with load to the center of the clearing).

DIAGONAL COMPRESSION OF WALLS

Murotech structural elements (Fabricated in cement, EPS, foam, sand,and covered in calcium silicate sheets)		Complementary Technical Standards for Construction And Design of Masonry Structures for Guadalajara 1997			
Thickness (in)	Revised resistance to compression				
		Annealed clay parition wall	Concrete or block of concrete	Concrete or block of concrete	Parition wall with gaps
2.36 in	159.44 psi	49.78 psi	42.67 psi	49.78 psi	42.67 psi
2.95 in	163.57 psi				
3.54 in	145.65 psi				

The specimens were tested as stipulated in the "Complementary technical standards for construction and design of masonry structures," of the construction regulations for the Mexican Federal district. (numeral 2.8.2 Resistance to diagonal compression).The results of the diagonal compression tests of walls including shear stress angular deformation curves are contained in the Report of Results Annex to this document.

The resistance design was obtained in accordance with the procedure indicated in section 2.8.2.1 of the complementary technical standards mentioned.

WALL PERMEABILITY

Ceiling	Thicknes	idth	Lengt	Mass	Water added initially	Water added in the end	Permeability (%)
1	2.36 in	15.75 in	15.75 in	14.11 in	33.81 fl oz	33.81 fl oz	0.01
2	3.54 in	15.75 in	15.75 in	18.36 in	33.81 fl oz	33.81 fl oz	0.01

WALL AGING TEST

ID	Thickness (in)	Width (in)	Length (in)	Color	Initial mass	Final Mass	Absorption %
1A	2.36 in	5.83 in	5.87 in	White	1.79lb	1.77lb	1.6%
1B	2.36 in	5.91 in	5.79 in	White	1.71lb	1.69lb	0.7%
2A	3.46 in	5.91 in	6.02 in	White	2.50lb	2.44lb	2.5%
2B	3.46 in	5.94 in	5.94 in	White	2.61lb	2.55lb	2.1%

The specimen was submitted to various cycles of weather exposure during nocturnal and daytime schedules during ten days.

The specimen did not present changes in volume, discoloration, or show detachment of the faces of the wall with the cement, EPS, polystyrene, foam and sand.

STUDY OF THERMAL LOADS

In comparison to a conventional construction system, MUROTECH® construction system would have a refrigeracion decrease of 8.6 tons, of which generates 41% of energy saving from the air conditioning system.

Description	Traditional construction system	Lightened construction system on a plaster, fibers and foam base	Murotech
Wall	Ceramic brick	Lightened material	Murotech 3.54in
Roof	Sheet	Lightened material	Murotech 2.95in
Room surface	3356.19 ft2	3356.19 ft2	3356.19 ft2
Maximum capacity of persons	48	48	48
Ft2 per person	69.97 ft2	69.97 ft2	69.97 ft2
Illumination W/ft2	1.86 W/ft2	1.86 W/ft2	1.86 W/ft2
Tons of refrigeration	20.5	14.6	11.9
Ft2 per ton of refrigeration	163.61 ft2	230.35 ft2	282.01 ft2
Interior temperature	75.2 F	75.2 F	75.2 F
RH not controlled	50%	50%	50%

WALL TECHNICAL SHEET

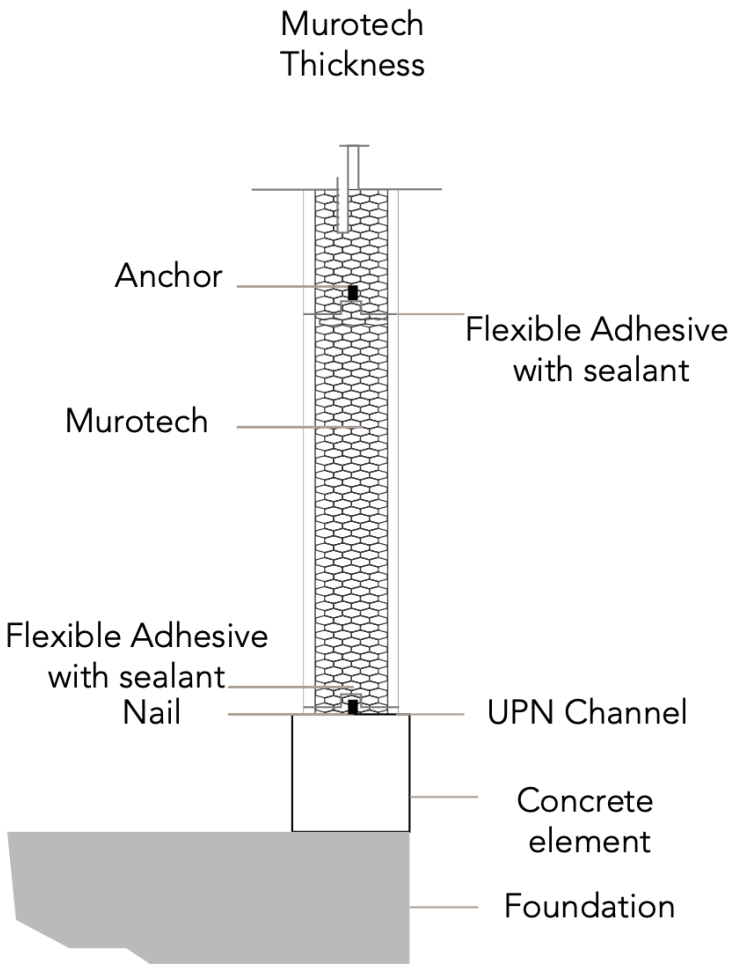
Material thickness (in)	Weight of Material (psf)	Resistance to diagonal compression	Resistance to flexion	Resistance design to simple compression	Aging absorption %
2.36in	9.22 psf1	59.44 psi	291.58 psi	316.18 psi	1.15%
2.95in	11.47 psf	163.54 psi	163.57 psi	302.53 psi	1.73%
3.54in	13.11 psf	145.65 psi	284.47 psi	292.00 psi	2.30%

The MUROTECH® panel is manufactured with 50% cement, EPS, polystyrene,foam, sand, covered with calcium silicate in both faces.

It is available in sheets of 24.01 X 89.37 inches or 0.02 X 7.45sq2
0.1478 W / (m k), permeability
0.00%, limits to proof of fire at 1832°F for four hours.

It is installed on a PTR, sealing the "U" channel with nails and placing the flexible adhesive with sealant. They are sealed with others with a pressure anchor.

The product is ideal for walls exteriors, interiors, fences, perimetral, pretiles, places,with humidity like bathrooms,kitchen.



AWARDS

Quality Ambassador

DESIGNATION for

MUROTECH

received in Geneva, in the year 2019
for INTERNATIONAL STAR FOR QUALITY (ISAQ)

INTERNATIONAL STAR
FOR LEADERSHIP AWARD

Under the authority of BID Group One, it is a privilege to confer the appointment as Quality Ambassador, under the pledge to uphold the highest standards of Total Quality Management, embodied by the QC100 Total Quality Model, to mentor in matters of Quality and Excellence among business and organizational leaders, and to promote and design new strategies in the development of Total Quality Culture.

Quality Creed

As a Quality Ambassador, I will uphold and promote Quality Culture and serve as an arbitrator for Total Quality Management, under the guidance of the QC100 Total Quality Model. In the fulfillment of my responsibilities, I shall pursue excellence and efficiency, understanding and applying the guidelines and precepts established in the QC100 model, both as a mentor for Total Quality Management and in supervision of the internal policies in my own organization. As an appointed Quality Ambassador, I fully understand the responsibilities and authority of my commission as a proponent of Quality Culture. To that avail, I shall commit myself to continuous improvement ideals and the pursuit of excellence.

Geneva, the 14th of April, 2019

Jose E. Prieto
President and CEO of BID Group One

THE SOUL AND VOICE OF QUALITY
BID GROUP ONE | San Germán, 11 • 28020 MADRID- SPAIN • T. +34 91 597 33 69 • www.bid-org.com
Bid Group One, S.L. Inscrita en el Registro Mercantil de Madrid. Tomo 31331. Sección 8.a, Libro 0. Hoja M-563958. Inscripción 1.a C.I.F. B86792892

In 2019, Murotech received the “International Star For Quality” award and the appointment of “Quality Ambassador”, awarded by the international Business Initiative Directions (BID). The recognition is the “International Star Award for Leaders”, in the gold category for outstanding achievements of perseverance and leadership in excellence and quality. For BDI, Murotech is a company that with its products is committed to innovation, quality and technology.

AWARDS

INTERNATIONAL STAR FOR QUALITY CONVENTION
ISAQ
GENEVA 2019

BID QUALITY AWARD GENEVA

HONORARY
Member

CERTIFICATE

BID Group One
names as Honorary Member

MUROTECH

upon recognition for
INTERNATIONAL STAR FOR QUALITY (ISAQ)

BID Group One presents this designation as Honorary Member for commitment to quality and excellence in all professional endeavors, and to embody the responsibility of encouraging and promoting attention to all aspects of quality in your realm of influence.

TQM QC 100

Geneva, the 14th of April, 2019

Jose E. Prieto
President and CEO of BID Group One

Quality Mix

D-12-572-G

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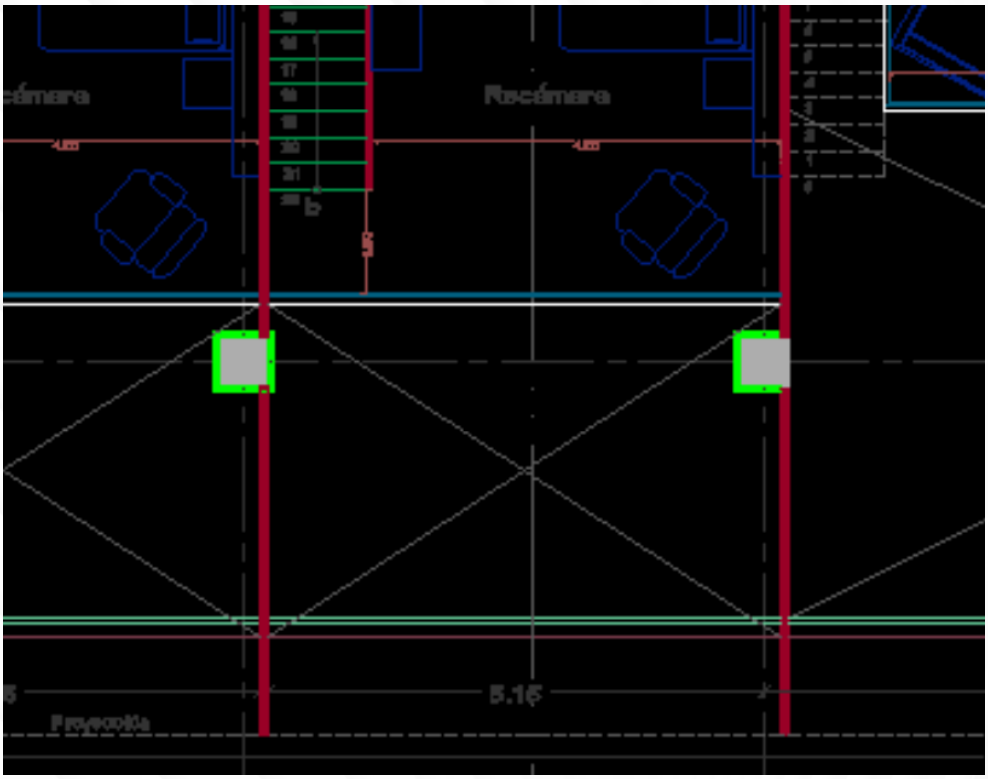
AWARDS

In 2019 Murotech got an Honorary Member of the BID Group One, upon recognition for the International Star for Quality (ISAQ)

MUROTECH PANEL

1 FIBERGLASS MESH

- Panels for recoverment
- Adjoining walls
- Panels with hard access



MUROTECH PANEL

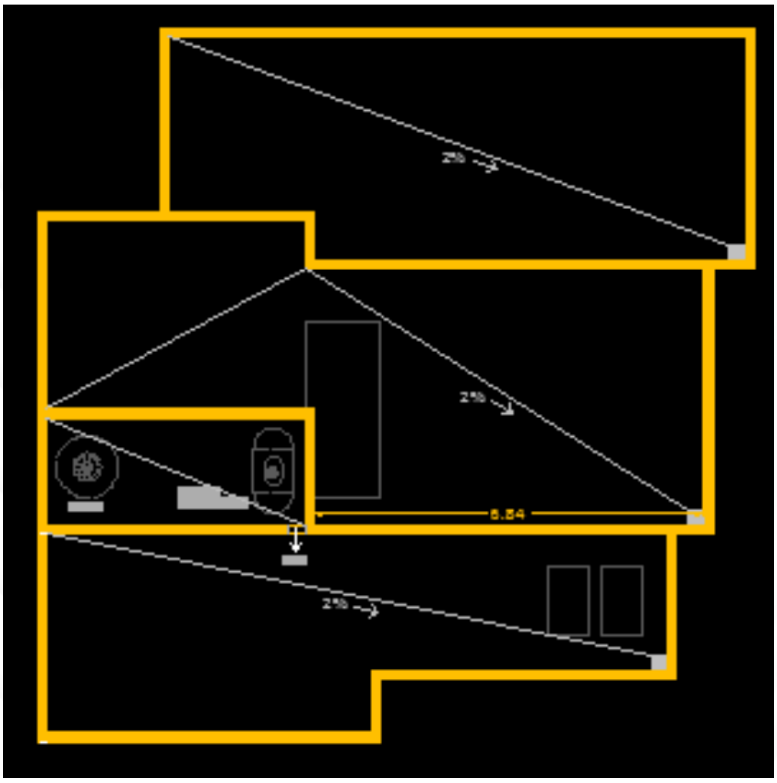
2 FIBERGLASS MESH

- Both sides are on interior space
- Interior walls

MUROTECH PANEL

3 FIBERGLASS MESH

- One side exterior, one side interior
- Perimeter walls



MUROTECH PANEL

4 FIBERGLASS MESH

- Both sides are on exterior
- Terrace walls
- Parapet

Results Report

Compound Portland Cement Resistance class CPC 40
(CPC 40)

Period of Report: August 1, 2018 to September 1, 2018

Physical Specifications		Test Method	Specification of Norm NMX-C0-414-ONNCCE-vigente		Results	units
			Minimum	Maximum		
Compression Resistance	3 days	NMX-C-061	-	-	34.3	N/mm2
	28 days*	NMX-C-061	40 N/mm2	-	46	N/mm2
Setting Time	Inicial	NMX-C-059	45 minutes	-	104	Minutes
	Final	NMX-C-059	-	600 minutes	204	Minutes
Volume stability in auto key		NMX-C-062	-0.20%	0.80%	-0.033	%
Expansion of summerged bars for a time period of 14 days		NMX-C-185	-	0.02%	0.011	%

Chemical Specifications	Test Method	Specification of Norm NMX-C0-414-ONNCCE-vigente		Result	units
		Minimum	Maximum		
Sulfur trioxide (SO3)**	NMX-C-131	-	4.00%	4	%

*Result of previous sample

**according to current NMX-C-414-ONNCCE standard, the allowed sulfur trioxide (SO3) limit can be exceeded if the expansions obtained in the test of bars submerged in water at 14 days, determined according to the current NMX-C-414-ONNCCE standard, are less than 0.20% maximum stipulated

I.Q.A. Rogelio Ramírez Flores
Coordinador de Control de Calidad

The results contained in this report correspond to the samples tested in the specified period.

EMBLEMATIC PROJECTS

MUROTECH PROJECTS

Mazatlan House (made completely out of Murotech)

Fiesta INN Hotel in Mexico

Plenitud Apartment Building

20 day difference

Boca Del Cielo MAZATLAN

Apartment building NOVENA

HAVANA LOFTS

AFFORDABLE HOUSING

COMING SOON


multitech


murotech


GUATEMALA
SOSTENIBLE
GREEN BUILDING FORUM 2019
Presentado por
BAM
muroTech
LA CONSTRUCCIÓN DEL FUTURO


CORPORACIÓN CISA
TierraEsperanza
spectrum
GUATEMALA
SOSTENIBLE
BUILDING FORUM 2019
BAM
muroTech
7zero


SALIDA

CERTIFICATIONS

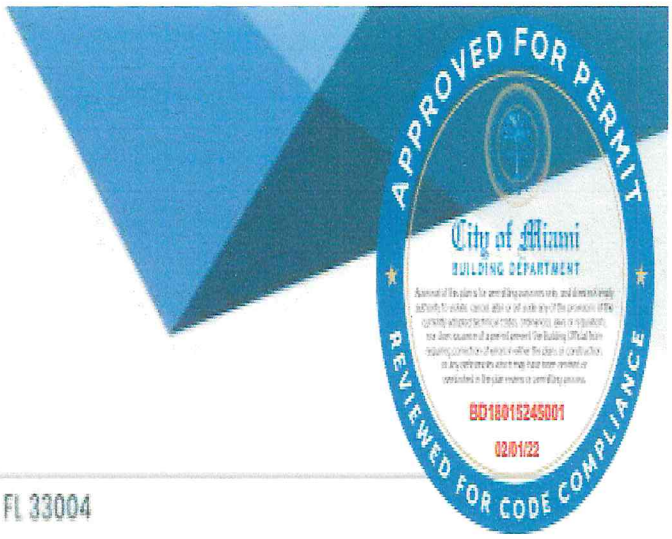
PERMITS

FLORIDA

HAVANA LOFTS

AFFORDABLE HOUSING

COMING SOON



BUILDING DROPS

398 E DANIA BEACH BLVD. SUITE 338, DANIA BEACH, FL 33004

December 7, 2021

TO: Whom It May Concern

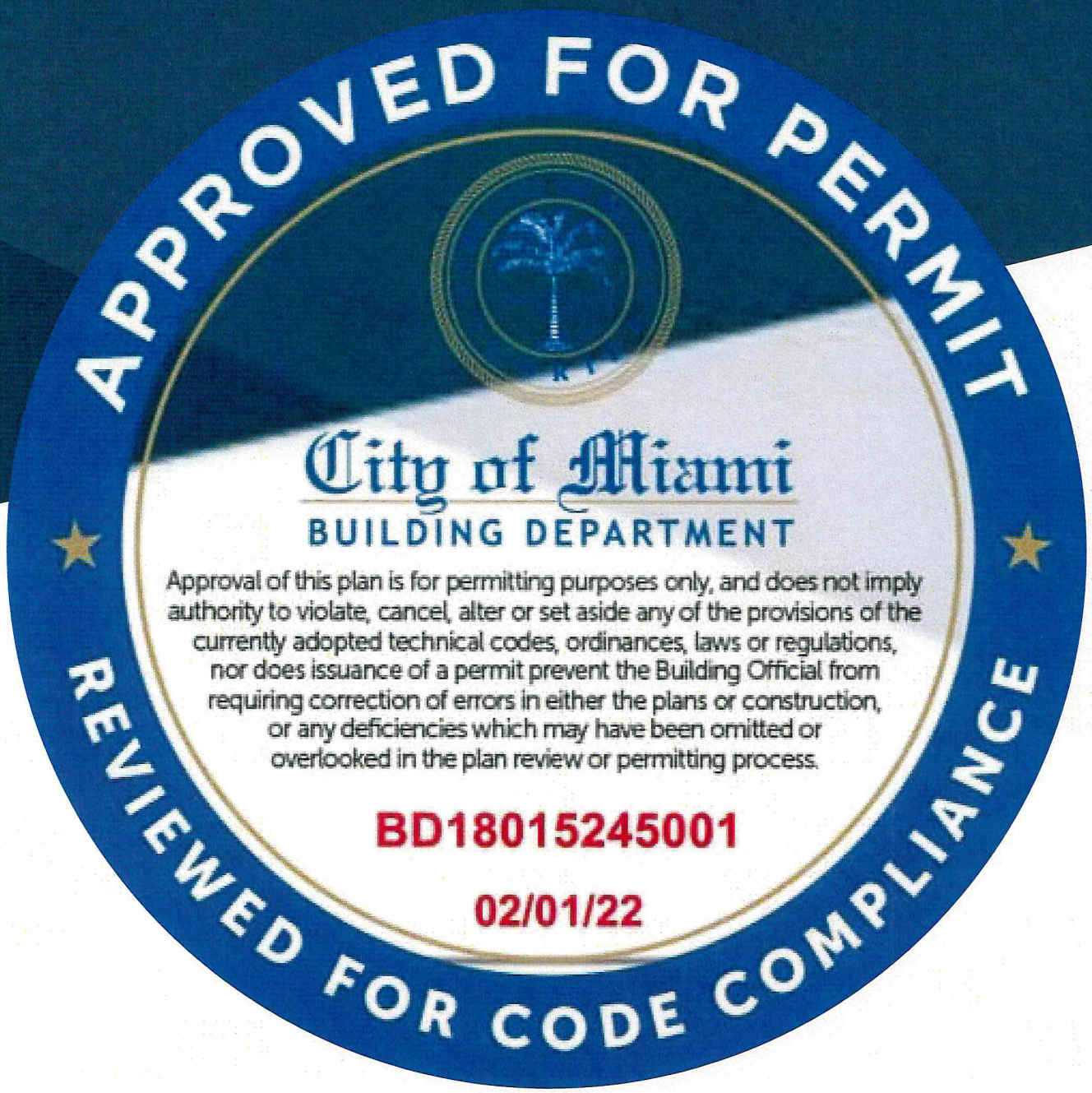
FROM: Hermes F. Norero, P.E.
Registered Florida Professional Engineer #73778

MANUFACTURER: US Murotech LLC
9000 Sheridan St., Suite 138
Pembroke Pines, FL 33024
PH: (786) 614-4469

Dear Sir (Madam),

The purpose of this letter is to address the use of Murotech's Exterior Wall Panels as an interior partition wall. To the best of my knowledge the panel may be qualified to be used as an interior partition wall in accordance with the 2020 Florida Building Code. The panel in reference with the existing testing done by Murotech can be considered adequate for use in the manner described herein.

The following chapters and sections in the most current FBC have been used to reference the panel's attributes for use


APPROVED FOR PERMIT
City of Miami
BUILDING DEPARTMENT
Approval of this plan is for permitting purposes only, and does not imply authority to violate, cancel, alter or set aside any of the provisions of the currently adopted technical codes, ordinances, laws or regulations, nor does issuance of a permit prevent the Building Official from requiring correction of errors in either the plans or construction, or any deficiencies which may have been omitted or overlooked in the plan review or permitting process.
BD18015245001
02/01/22
REVIEWED FOR CODE COMPLIANCE

2020 FLORIDA LIMITED LIABILITY COMPANY ANNUAL REPORT

FILED
Jun 15, 2020
Secretary of State
3987064502CC

DOCUMENT# L19000293058

Entity Name: US MUROTECH, LLC

Current Principal Place of Business:

328 CRANDON BLVD #120
KEY BISCAYNE, FL 33149

Current Mailing Address:

328 CRANDON BLVD #120
KEY BISCAYNE, FL 33149 US

FEI Number: 84-3935905

Certificate of Status Desired: No

Name and Address of Current Registered Agent:

FAILLACE, GILBERTO
328 CRANDON BLVD #120
KEY BISCAYNE, FL 33149 US

The above named entity submits this statement for the purpose of changing its registered office or registered agent, or both, in the State of Florida.

SIGNATURE:

Electronic Signature of Registered Agent — Date

Authorized Person(s) Detail :

Title	AMBR	Title	MGR
Name	PENA, MONICA L	Name	FAILLACE, GILBERTO
Address	328 CRANDON BLVD #120	Address	328 CRANDON BLVD #120
City-State-Zip:	KEY BISCAYNE FL 33149	City-State-Zip:	KEY BISCAYNE FL 33149

I hereby certify that the information indicated on this report or supplemental report is true and accurate and that my electronic signature shall have the same legal effect as if made under oath; that I am a managing member or manager of the limited liability company or the receiver or trustee empowered to execute this report as required by Chapter 605, Florida Statutes; and that my name appears above, or on an attachment with all other like empowered.

SIGNATURE: MONICA L. PENA AMBR 06/15/2020

Electronic Signature of Signing Authorized Person(s) Detail — Date

USMUROTECH®

Wall panel

VERSION 2020

TEN-YEAR limited warranty

328 Crandon Blvd. #120
Key Biscayne, FL 33149

November 2019

What is covered?

US Murotech warrants that our wall panels are manufactured in Mexico and sold by US Murotech for use enclosures, partition, stairs and between floors. This warranty includes only, and only if the installation and finish is made in compliance with the installation manual given my US MUROTECH engineers, failure to do so will result in no coverage of warranty. This shall use only the products USMUROTECH recommends and which are approved by our engineers. If other products are used, this warranty will not be accepted. The Murotech wall panel will be free from factory defects in the manufacturing of the product.

In the case of product damage in transportation via shipping containers, if the loss is greater than 5% of the complete container, the wall panels will be given. This warranty only extends to the sole exporter which is US Murotech and it must be within the warranty period.

How long does it last?

This warranty runs for ten (10) years starting from the day of installation of the USMUROTECH wall panel version 2020.

Conditions of the warranty:

In addition to the terms and conditions mentioned, the panels must be installed in compliance to the Installation manual given upon payment. The panels must be handled properly.

What we don't cover?

USMurotech shall not be held responsible for any loss resulting from:

1. Installation process not in compliance with the current installation instructions from USMUROTECH.

2. Installation practices not in compliance with the installation process/manual of the manufacturer of any product attached to the wall panel.

3. Failure to take care of the building

4. Damage due to acts of God: Earthquakes, hurricanes, tornados, storms,etc..

5. Improper handling of the product, way of storage, way of use, etc.

6. In case of a fortuitous event, if it has damage, filtration, or any flaw in the wall

panel.

This warranty will not cover defects resulting from the use of complementary materials from other manufacturers not mentioned and recommended by the engineers from US Murotech. Unless the complementary material used is specifically recommended by the US murotech engineers.

What will we do?

USmurotech will if applicable replace the Murotech wall panel but will not give any monetary refund.

How do I get service?

The service with be given only, and only if the problem is declared to US murotech within 30 days of the time arrival to construction site.

A brief description of the incident and the following requirements need to be given in order to receive the service:

1. Pictures of the time of the incident (after pictures are allowed)
2. Sale receipts
3. Evidence of the date of installation

Send it directly to:

US Murotech

Or via email: infomurotech@gmail.com

Where does it apply?

This warranty applies to the US murotech wall panel version 2020 manufactured by Murotech. It only covers if the product is bought and installed inside the United States.

EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 858-4800

Attn.: ***Monica Peña***
US Murotech

EMSL Order ID:	362002876
Sample(s) Received:	11/6/2020
Date of Reporting:	11/27/2020
Date Printed:	11/27/2020
Reported By:	D. Macready

Descriptions & Definitions:

None Detected (ND) denotes the absence of an analyte in the subsample analyzed. Trace levels of the analyte may be present in the sample below the limit of detection (LOD).

Limit of Detection (LOD): The minimum concentration that can be theoretically achieved for a given analytical procedure in the absence of matrix or sample processing effects. Particle analysis is limited to a single occurrence of an analyte particle in the sub-sample analyzed.

Limit of Quantitation (LOQ): The minimum concentration of an analyte that can be measured within specified limits of precision and accuracy during routine laboratory operating conditions

Important Terms, Conditions, and Limitations:

Sample Retention: Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling may be returned to the client immediately. EMSL reserves the right to charge a sample disposal or return shipping fee.

Change Orders and Cancellation: All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

Warranty: EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures, when applicable. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

Limits of Liability: In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

The data and other information contained in this report, as well as any accompanying documents, represent only the samples analyzed. They are reported upon the condition that they are not to be reproduced wholly or in part for advertising or other purposes without the written approval from the laboratory.

EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077
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Attn.: ***Monica Peña***
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Reported By:	D. Macready

- Laboratory Report -

Procurement of Samples and Analytical Overview:

The sample for analysis (one composite sample, six solid cubes, three marked for analysis) arrived at EMSL Analytical (Cinnaminson, NJ) on November 6, 2020. The package arrived in satisfactory condition with no evidence of damage to the contents. The samples were submitted for the purpose of Water Absorption analysis. The data reported herein has been obtained using the following equipment and methodologies.

Methods & Equipment: ASTM D570 - Water Absorption of Plastics
Forced Air Drying Oven
Balance (0.0001g sensitivity)

Analyzed by: _____ November 20, 2020
Daniel J Macready ***Date***
Materials Science Engineer

Reviewed/Approved: _____ November 27, 2020
Eugenia Mirica, Ph.D. ***Date***

EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 858-4800

Attn.: Monica Peña
US Murotech

EMSL Order ID:	362002876
Sample(s) Received:	11/6/2020
Date of Reporting:	11/27/2020
Date Printed:	11/27/2020
Reported By:	D. Macready

Procurement of Samples:

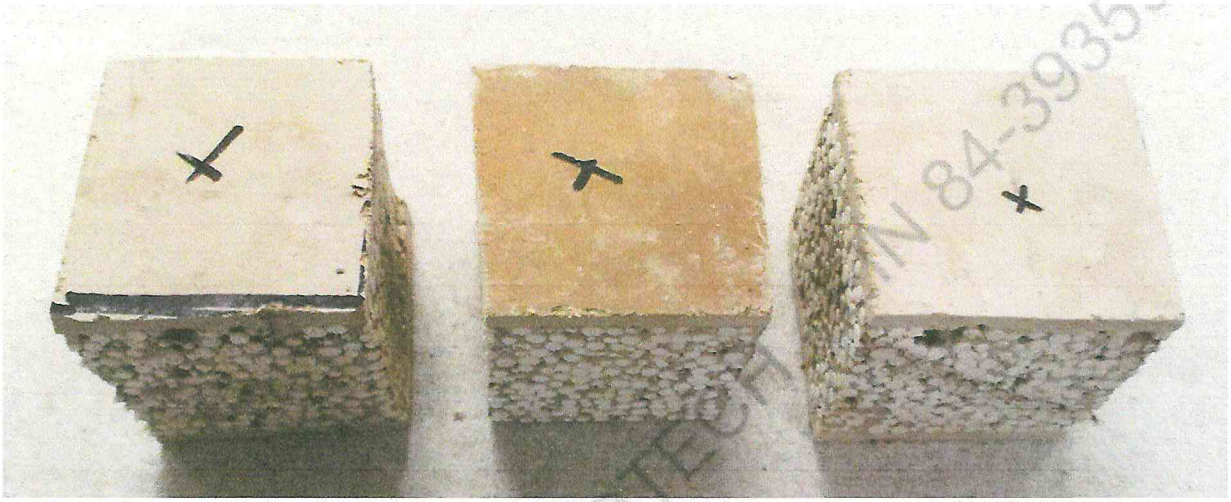


Figure 1. Image of the as-received samples. Appearing from left to right are samples 362002876-0001, 362002876-0002, and 362002876-0003.

Table 1: Identification of the samples submitted for analysis:

Customer Sample ID	EMSL Sample ID	Sample Description	Dimensions (mm)
1	362002876-0001	Murotech panel 2x2	49.25 x 52.00 x 56.00
2	362002876-0002	Murotech panel 2x2	51.00 x 50.75 x 53.25
3	362002876-0003	Murotech panel 2x2	50.75 x 54.25 x 56.50

Conditioning of Samples:

The samples were conditioned in a forced air drying oven for 24 hours at 50°C prior to the initial weight measurement. They were reconditioned in the same manner prior to the final weight measurement.

EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 858-4800

Attn.: *Monica Peña*
US Murotech

EMSL Order ID:	362002876
Sample(s) Received:	11/6/2020
Date of Reporting:	11/27/2020
Date Printed:	11/27/2020
Reported By:	D. Macready

Results:

EMSL Sample ID:	**362002876-0001**	
Customer Sample Number:	**1**	
Customer Sample Description:	**Murotech panel 2x2**	
Parameter	**Value (wt%)**	**Conditions**
Percentage Increase in Weight During Immersion	17.75	24 Hour Immersion 23°C
Percentage of Soluble Matter Lost During Immersion	0.00	24 Hour Immersion 23°C
Percentage of Water Absorbed	17.75	24 Hour Immersion 23°C

EMSL Sample ID:	**362002876-0002**	
Customer Sample Number:	**2**	
Customer Sample Description:	**Murotech panel 2x2**	
Parameter	**Value (wt%)**	**Conditions**
Percentage Increase in Weight During Immersion	17.30	24 Hour Immersion 23°C
Percentage of Soluble Matter Lost During Immersion	0.00	24 Hour Immersion 23°C
Percentage of Water Absorbed	17.30	24 Hour Immersion 23°C

EMSL Sample ID:	**362002876-0003**	
Customer Sample Number:	**3**	
Customer Sample Description:	**Murotech panel 2x2**	
Parameter	**Value (wt%)**	**Conditions**
Percentage Increase in Weight During Immersion	19.14	24 Hour Immersion 23°C
Percentage of Soluble Matter Lost During Immersion	0.00	24 Hour Immersion 23°C
Percentage of Water Absorbed	19.14	24 Hour Immersion 23°C

EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 858-4800

Attn.: *Monica Peña*
US Murotech

EMSL Order ID:	362002876
Sample(s) Received:	11/6/2020
Date of Reporting:	11/27/2020
Date Printed:	11/27/2020
Reported By:	D. Macready

Average of Results:

EMSL Sample ID: **362002876-0001, 362002876-0002, 362002876-0003** ***Customer Sample Number:*** **1,2,3** ***Customer Sample Description:*** **Murotech panel 2x2**		
Parameter	**Value (wt%)**	**Conditions**
Percentage Increase in Weight During Immersion	18.06	24 Hour Immersion 23°C
Percentage of Soluble Matter Lost During Immersion	0.00	24 Hour Immersion 23°C
Percentage of Water Absorbed	18.06	24 Hour Immersion 23°C

FINAL REPORT

PROTOCOL

Modified ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

PRODUCT TESTED

Murotech Concrete Blocks

TESTING LABORATORY

EMSL Analytical, Inc.
5950 Fairbanks North Houston Rd.
Houston TX 77040
Phone: (713) 686-3635
Web: www.emsl.com

SPONSOR

Murotech

STUDY START DATE

June 19, 2020

STUDY COMPLETION DATE

August 6, 2020

Test Summary

Project Title: Resistance to Growth of Mold on the Surface of Murotech in an Environmental Chamber

Study Methods: Modified ASTM D3273 – Standard Test Method for resistance to growth of mold on the surface of interior coatings in an environmental chamber.

Products Tested: Concrete Blocks

Sponsor: Murotech

Test Conditions: Soil chamber, 95-98% relative humidity, 32°C ±1

Challenge Fungi: ***Aspergillus brasiliensis*** (ATCC 6275), ***Penicillium chrysogenum*** (ATCC 10106), and ***Aureobasidium pullulans*** (ATCC 15233)

Study Dates and Facilities

All analytical testing was performed at EMSL Analytical, Inc. in Houston, Texas from date 6/19/2020 to 8/6/2020.

Record Retention

All raw data and a copy of the final report will be archived and stored by EMSL Analytical, Inc. for 5 years.

Objectives

To determine the ability of the material to resist fungal growth under conditions favorable for such growth.

Test Method

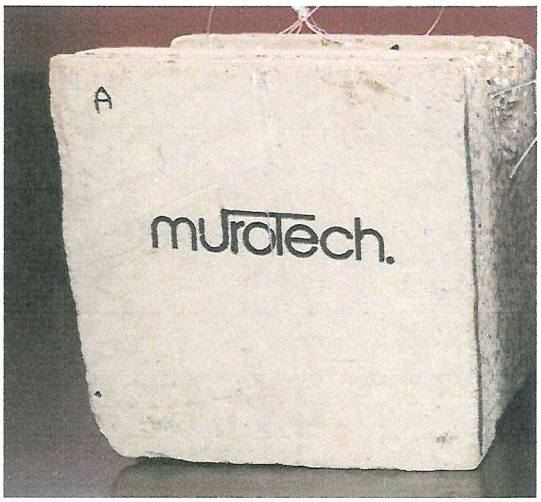
Fungal species were grown separately on Malt Extract Agar (MEA) for 7 days. A spore suspension of each of the three fungi was prepared by pouring 10 mL of sterile DI water containing 0.5 g/L of Tween 20 into the culture plate. The surface growth was gently scraped from the culture of each test organism using cotton swab to remove as much spore and mycelial growth as possible without digging up the surface of the agar. The spore suspension was transferred into a flask containing 90 mL of sterile DI water. The flask was shaken gently to break the spore clumps. The spore suspension was distributed evenly over the surface of the green house soil in the chamber. The test chamber was controlled at a constant temperature (32.5 ± 1°C) and humidity (95-98%). The samples were incubated for 28 days. Following incubation, pictures were taken and observations on fungal growth were made.

Pictures were taken before and after incubation to show comparison of mold growth on both test and control materials according to ASTM D3274 which uses photographic reference standards on a 0 to 10 rating scale; whereby a 10 rating has no disfigurement (growth) and 0 has the most disfigurement (growth).

Observed Growth on Specimens	Scale Rating
No mold growth detected	10
Heavy growth mold growth detected	0

Experimental Results:

Sample 1A – side 1 @ T=0



Observation: 10 – No mold growth

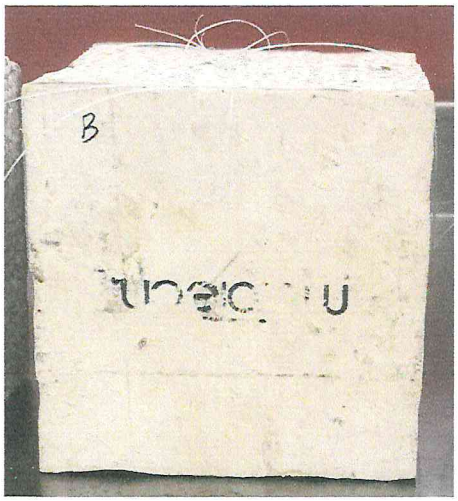
Sample 1A – side 1 @ T=28 days

Observation: 10 – No mold growth

Sample 1A – side 2 @ T=28 days

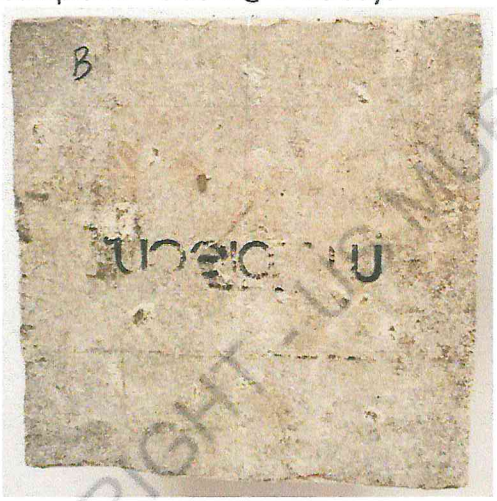
Observation: 10 – No mold growth

Sample 1B – side 1 @ T=0



Observation: 10 – No mold growth

Sample 1B – side 1 @ T=28 days



Observation: 10 – No mold growth

Sample 1B – side 2 @ T=28 days

Observation: 10 – No mold growth

Sample 1C – side 1 @ T=0 days

Observation: 10 – No mold growth

Sample 1C – side 1 @ T=28 days

Observation: 10 – No mold growth

Sample 1C – side 2 @ T=28 days

Observation: 10 – No mold growth

CONTROLS @ T=0

Control A

Control B

Control C

Observation: 10 - No mold growth

CONTROLS @ 28 days

Control A

Control B

Control C

Observation: 0 - Heavy mold growth

Conclusions

The Murotech product was found to be resistant to fungal with no visible growth after the 4 week challenge test.

References

D 3273 – 00 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

Signatures

Study Performed by:

Mona Ramadi, Ph.D.
Microbiologist

Report Issued by:

Jason Dobranic, Ph.D.
Vice President of Microbiology & Life Sciences
Study Director

TEXAS

CONSTRUCTION TESTING SCIENCES
2978 Congressman Lane, Dallas, TX 75220
Phone: 214.789.3472
www.ctsciences.com

Report of Compressive Properties of Concrete Panels

Client: MuroTech **Project No.:** 14852
Project: Compressive Properties of Concrete Panels **Date of Service:** 11/30/21
Project No.: 21-01308-900-01

Material: MuroTech Panels
Test Method: ASTM D1621, Compressive Properties of Rigid Cellular Plastics
Calculation: Appled Load / (Length x Width) at 10% Displacement
Loading: Load applied at a rate of crosshead displacement equal to 10% of the sample thickness per minute

Nominal Dimensions:

Length (inches)	Width (inches)	Height (inches)
6.00	6.00	3.00

Conditioning: Dry: 48 hours in a heated, ventilated, chamber at 120° F (+/-4F)

Sample Number	Thickness (inches)	Dimensions			Compressive Load @ 10% Displacement (lbf)	Compressive Strenth @ 10% Displacement (psi)
		Length (inches)	Width (inches)	Area (sq. in.)		
1	2.98	5.57	5.92	32.97	7,296	221
2	2.96	5.65	5.91	33.39	7,892	236
3	2.98	5.48	5.94	32.55	7,290	224
4	2.99	5.92	5.91	34.99	7,500	214
5	2.97	5.91	5.93	35.05	7,860	224
Average:						**224**
Standard Deviation:						**8**
Variance:						**3.57**

Technician: J. Halverson

Jack Gary, General Manager

Construction Testing Sciences
2978 Congressman Lane, Dallas, TX 75220
Phone: 214.789.3472
www.ctsciences.com

Report of Breaking Load & Flexural Properties

Client: MuroTech **Report No.:** 14851
Project: Flexural Properties of Concrete Panels **Date of Service:** 11/30/21
Project No.: 21-01308-900-01

Material: MuroTech Panels
Test Method: ASTM C203, Test Method for Breaking Load & Flexural Properties of Block-Type Thermal Insulation, Method 1
Calculation: (3 x the failure load x the span) / (2 x width x thickness squared)
Loading: Applied center point with the finished face in tension at 300 psi per minute.
Nominal Dimensions:

Span (inches)	Width (inches)	Thickness (inches)
30	11.9	2.9

Conditioning: Tested as received in an "as is" condition

Finish: Cementitious Layer both sides

Sample Number	Block Number	Dimensions			Failure Load (pounds)	Test Results (psi)
		Span (inches)	Width (inches)	Thickness (inches)		
1	N/A	30.00	11.90	2.91	1415	632
2	N/A	30.00	11.90	2.93	1460	643
3	N/A	30.00	11.85	2.97	1380	594
4	N/A	30.00	11.90	2.91	1355	605
5	N/A	30.00	11.89	3.01	1388	580
Average wet mode:						**611**
Standard deviation:						26
Variance:						4.26 %

Technician: J. Halverson

Jack Gary, General Manager

MEXICO

Guadalajara, Jal. 4 de Agosto de 2016

A&GV Builders S.A. de C.V.
ING. JAZMÍN GONZÁLEZ
P R E S E N T E

"ESTUDIO DE RESISTENCIA A LA COMPRESIÓN, FLEXIÓN Y COMPRESIÓN DIAGONAL DE MURETES (MUROTECH)"

Presentamos a usted los resultados de las pruebas realizadas por nuestro personal técnico a doce muestras de elementos estructurales Murotech (fabricados con Cemento, EPS, Poliestileno, espuma y arena, y cubiertos con silicato de calcio) a la compresión, seis a flexión y seis a compresión diagonal.

Las muestras fueron cortadas y proporcionadas por el cliente, los ensayos se evaluaron con las NTC-2004 (Normas Técnicas Complementarias para Diseño y Construcción de Estructuras de Mampostería del Distrito Federal)

1.- EJECUCIÓN DE LOS ENSAYOS.

A.- COMPRESIÓN SIMPLE.

Los especímenes fueron ensayados según lo estipulado en las "Normas técnicas complementarias para diseño y construcción de estructuras de mampostería", del reglamento de construcciones para el Distrito Federal (numeral 2.8.1 Resistencia a compresión) y a la norma NMX-C-083-ONNCCE-2014 Determinación de la Resistencia a la Compresión de Especímenes.

Presentando los siguientes resultados

Muro	Ancho (cm)	Largo (cm)	Alto (cm)	Alto / Ancho (cm)	Área bruta (cm^2)	Factor Correctivo	Fuerza (kg)	Resistencia (kgf/cm^2)	Resistencia Corregida (kgf/cm^2)	Módulo de Elasticidad (kgf/cm^2)
1	7,3	42,5	30,1	4,12	310,3	1,006	8 158	26,3	26,4	6 517
2	7,3	42,5	30,1	4,12	310,3	1,006	10 670	34,4	34,6	6 499
3	7,3	42,5	30,1	4,12	310,3	1,006	8 386	27,0	27,2	10 177

Media (kgf/cm^2)	$\overline{f_m}$	29,41	7 731
Desviación Estándar (kgf/cm^2)	σ	4,50	
Coeficiente de variación	c_m	0,15	
Resistencia de diseño a compresión (kgf/cm^2)	f_m^*	21,27	

$$f_m^* = \frac{\overline{f_m}}{1+2.5\,c_m}$$

$\overline{f_m}$ = Es el promedio de la resistencia de las pilas ensayadas, corregidas por esbeltez

c_m El coeficiente de variación de la resistencia de las pilas ensayadas, que en ningún caso se tomara inferior a 0.15

Muro	Ancho (cm)	Largo (cm)	Alto (cm)	Alto / Ancho (cm)	Área bruta (cm²)	Factor Correctivo	Fuerza (kg)	Resistencia (kgf/cm²)	Resistencia Corregida (kgf/cm²)	Módulo de Elasticidad (kgf/cm²)
1	9,0	42,0	36,0	4,00	378,0	1,000	10 390	27,5	27,5	10 530
2	9,0	42,0	36,0	4,00	378,0	1,000	11 916	31,5	31,5	5 982
3	9,0	42,0	36,0	4,00	378,0	1,000	9 702	25,7	25,7	10 216
							Media (kgf/cm²)	$\overline{f_m}$	28,23	10 373
							Desviación Estándar (kgf/cm²)	σ	3,00	
							Coeficiente de variación	c_m	0,11	
							Resistencia de diseño a compresión (kgf/cm²)	f_m^*	20,53	

$$f_m^* = \frac{\overline{f_m}}{1+2.5\,c_m}$$

f_m^* = Resistencia de diseño a compresión

$\overline{f_m}$ = Es el promedio de la resistencia de las pilas ensayadas, corregidas por esbeltez

c_m = El coeficiente de variación de la resistencia de las pilas ensayadas, que en ningún caso se tomara inferior a 0.15

Para tener una referencia de las resistencias obtenidas en los ensayos a compresión, se presentan resistencias de muros de mampostería ensayados a compresión simple (Normas Técnicas Complementarias para Diseño y Construcción de Estructuras de Mampostería para Guadalajara 1997).

Tabla 2.8 Resistencia de diseño a compresión de la mampostería, f_m^*, para algunos tipos de piezas, sobre área bruta

Tipo de pieza	f_m^*, (kg/cm²) Mortero I	Mortero II	Mortero III
Tabique de barro recocido	10	10	10
Tabicón de jalcreto o concreto ($f_p^* \geq 40$ kg/cm²)	10	10	10
Bloque de jalcreto o concreto (1) ($f_p^* \geq 40$ kg/cm²)	10	10	10
Tabique con huecos verticales. (1) ($f_p^* \geq 120$ kg/cm²)	25	25	25

(1) La relación área neta-bruta no será menor de 0.45.

RESUMEN: Presentamos a usted el resumen y comparativo de los ensayes a compresión simple.

Elementos estructurales Murotech (fabricados con Cemento, EPS, Poliestileno, espuma y arena, y cubiertos con silicato de calcio)		Normas Técnicas Complementarias para Diseño y Construcción de Estructuras de Mamposteria para Guadalajara 1997			
Espesor (cm)	**Resistencia a la compresión corregida (kgf/cm2)**	**Material más comunes Resistencia a la compresión (kgf/cm2).**			
		Tabique de barro recocido	Tabicón de jalcreto o concreto ($f_p^* \geq$ 40 kg/cm²)	Bloque de jalcreto o concreto (1) ($f_p^* \geq$ 40 kg/cm²)	Tabique con huecos verticales. (1) ($f_p^* \geq$ 120 kg/cm²)
7,5	29,4	10	10	10	25
9,0	28,2				

B.- RESISTENCIA A LA FLEXIÓN.

Resistencia a flexión mediante carga puntual al centro de la cubierta de silicato de calcio, empleando como transmisor de carga una place de dimensiones especificadas. Los especimenes fueron ensayados según lo estipulado en las normas ASTM Designación: C 293 – 02 Método de Ensayo Estándar para Resistencia a la Flexión del Concreto (Usando una Viga Simple con Carga al Centro del Claro). Y a la norma NMX-C-303-ONNCCE-2010 Determinación de la resistencia a la flexión del concreto usando una viga simple con carga en el centro del claro.

Muestra	Espécimen	Prueba Realizada	Dimensiones Claro Lc (mm)	Ancho b1 (mm)	Espesor c (mm)	Fuerza máx (N)	Esfuerzo máx (kPa)	Esfuerzo máx (kgf/cm²)
1	1	Flexión	168,00	60,69	60,48	1 567	1991	20
	2		168,00	60,47	60,41	1 618	2067	21
1	1	Flexión	236,00	73,50	73,89	972	858	9
	2		236,00	74,37	73,68	1 518	1332	14
1	1	Flexión	271,00	90,70	89,69	3 577	1993	20
	2		272,00	90,22	90,12	3 448	1920	20

*Fuerza aplicada en dirección perpendicular a la ubicación de las caras.

C.- COMPRESIÓN DIAGONAL DE MURETES.

Los especimenes fueron ensayados según lo estipulado en las "Normas técnicas complementarias para diseño y construcción de estructuras de mampostería", del reglamento de construcciones para el Distrito Federal (numeral 2.8.2 Resistencia a compresión diagonal). Los resultados de los ensayos a compresión diagonal de muretes incluyendo las curvas esfuerzo cortante - deformación angular están contenidos en el Informe de Resultados Anexo a este documento.

Las resistencias de diseño fueron obtenidas de acuerdo con el procedimiento indicado en la sección 2.8.2.1 de las normas técnicas complementarias citadas.

No. Murete	Espesor (cm)	Largo (cm)	Alto (cm)	Alto/Ancho (cm)	Área bruta (cm²)	Factor Correctivo	Fuerza (kg)	Resistencia (kgf/cm²)	Resistencia Corregida (kgf/cm²)
1	6,0	60,0	60,0	10,00	509,1	1,300	2100	4,1	5,4
2	6,0	60,0	60,0	10,00	509,1	1,300	7260	14,3	18,5
3	6,0	60,0	60,0	10,00	509,1	1,300	3810	7,5	9,7

$$c_v \geq 0,2$$

$$v_m^* = \frac{\overline{v_m}}{1 + 2,5c_v}$$

Media (kgf/cm²)	$\overline{v_m}$	11,21
Desviación Estándar (kgf/cm²)	σ	6,71
Coeficiente de variación	c_v	0,60
Resistencia de diseño a compresión (kgf/cm²)	v_m^*	4,49

No. Murete	Espesor (cm)	Largo (cm)	Alto (cm)	Alto/Ancho (cm)	Área bruta (cm²)	Factor Correctivo	Fuerza (kg)	Resistencia (kgf/cm²)	Resistencia Corregida (kgf/cm²)
1	7,5	60,0	60,0	8,00	636,4	1,200	4 600	7,2	8,7
2	7,5	60,0	60,0	8,00	636,4	1,200	6 800	10,6	12,8
3	7,5	60,0	60,0	8,00	636,4	1,200	6 900	10,8	13,0

$$c_v \geq 0,2$$

$$v_m^* = \frac{\overline{v_m}}{1 + 2,5c_v}$$

Media (kgf/cm²)	$\overline{v_m}$	11,50
Desviación Estándar (kgf/cm²)	σ	2,45
Coeficiente de variación	c_v	0,21
Resistencia de diseño a compresión (kgf/cm²)	v_m^*	7,5

No Murete	Espesor (cm)	Largo (cm)	Alto (cm)	Esp./Ancho (cm)	Área bruta (cm^2)	Factor Correctivo	Fuerza (kg)	Resistencia (kgf/cm^2)	Resistencia Corregida (kgf/cm^2)	Módulo de Rigidez (kgf/cm^2)
1	9,0	60,0	60,0	6,67	763,7	1,133	7060	9,2	10,5	3 368
2	9,0	60,0	60,0	6,67	763,7	1,133	5640	7,4	8,4	3 390
3	9,0	60,0	60,0	6,67	763,7	1,133	8010	10,5	11,9	2 269

$$c_{v \geq 0,2}$$

$$v_m^* = \frac{\overline{v_m}}{1 + 2{,}5c_v}$$

Media (kgf/cm^2)	$\overline{v_m}$	10,24
Desviación Estándar (kgf/cm^2)	σ	1,77
Coeficiente de variación	c_v	0,17
Resistencia de diseño a compresión (kgf/cm^2)	v_m^*	6,83

o. Murete	Espesor (cm)	Largo (cm)	Alto (cm)	Alto/Ancho (cm)	Área bruta (cm^2)	Factor Correctivo	Fuerza (kg)	Resistencia (kgf/cm^2)	Resistencia Corregida (kgf/cm^2)	Módulo de Rigidez (kgf/cm^2)
1	12,0	60,0	60,0	5,00	1018,2	1,050	6820	6,7	7,0	2 922
2	12,0	60,0	60,0	5,00	1018,2	1,050	4670	4,6	4,8	3 250
3	12,0	60,0	60,0	5,00	1018,2	1,050	6730	6,6	6,9	5 679

$$c_{v \geq 0,2}$$

$$v_m^* = \frac{\overline{v_m}}{1 + 2{,}5c_v}$$

Media (kgf/cm^2)	$\overline{v_m}$	6,26
Desviación Estándar (kgf/cm^2)	σ	1,25
Coeficiente de variación	c_v	0,20
Resistencia de diseño a compresión (kgf/cm^2)	v_m^*	4,17

v_m^* Resistencia de diseño a compresión

$\overline{v_m}$ Es el promedio de los esfuerzos resistentes de los muretes ensayados. Corregidas por esbeltez

c_v Es el coeficiente de variación de los esfuerzos resistente de los muretes ensayados que no se tomara menor que 0.20

Nota: Para el cálculo de la resistencia de diseño a compresión se toma el promedio de la resistencia corregida por esbeltez

Para tener una referencia de la resistencia obtenidas de los ensayos a compresión diagonal se presentan resistencias de muros de mampostería ensayados a compresión diagonal.

Tabla 2.9 Resistencia de diseño a compresión diagonal para algunos tipos de mampostería, sobre área bruta

Pieza	Tipo de mortero	v_m* [1], MPa (kg/cm²)
Tabique de barro recocido (f_p* ≥ 6 MPa, 60 kg/cm²)	I	0.35 (3.5)
	II y III	0.3 (3)
Tabique de barro con huecos verticales (f_p* ≥ 12 MPa, 120 kg/cm²)	I	0.3 (3)
	II y III	0.2 (2)
Bloque de concreto (pesado[2]) (f_p* ≥ 10 MPa, 100 kg/cm²)	I	0.35 (3.5)
	II y III	0.25 (2.5)
Tabique de concreto (tabicón) (f_p* ≥ 10 MPa, 100 kg/cm²)	I	0.3 (3)
	II y III	0.2 (2)

RESUMEN: Presentamos a usted(es) el resumen y comparativo de los ensayes a compresión diagonal.

Elementos estructurales Murotech (fabricados con Cemento, EPS, Poliestileno, espuma y arena, y cubiertos con silicato de calcio)		Normas Técnicas Complementarias para Diseño y Construcción de Estructuras de Mampostería para Guadalajara 1997			
Espesor (cm)	**Resistencia a la compresión diagonal corregida (kgf/cm2)**	**Material más comunes Resistencia a la compresión diagonal (kgf/cm2).**			
		Tabique de barro recocido	Tabicón de jalcreto o concreto (f_p* ≥ 40 kg/cm²)	Bloque de jalcreto o concreto [1] (f_p* ≥ 40 kg/cm²)	Tabique con huecos verticales. [1] (f_p* ≥ 120 kg/cm²)
6.0	11.21	3.5	3	3.5	3
7.5	11.50				
9.0	10.24				
12.0	6.26				

E.- RESISTENCIA AL IMPACTO DE MURETES.

Los especímenes fueron ensayados según lo estipulado en las "NMX-C-405-1997-ONNCCE", Industria de la Construcción – Paneles para uso Estructural en Muros, Techos y Entrepisos, en el apartado 6.2.2. Resistencia al impacto para muros. Los resultados de los ensayos al impacto de caída libre en se presentan en el Informe de resultados Anexo a este documento.

Losa	Espesor (cm)	Ancho (cm)	Longitud (cm)	Claro de Prueba (cm)	Masa (kg)	Altura de caída	Deflexión δ1 (mm)	Especificación Deflexión L/360 (mm)
1	9,0	60,0	227,0	227,0	15,0	0,5	2,0	6,3

Resistencia especificada al impacto (Norma NMX – C – 1997 – ONNCCE)

Debe de resistir el impacto en caída libre provocado por una masa de 50 kg, que se suelta desde una altura de caída de 1,50 m sin rebasar una flecha de L/360, donde L es la longitud del claro mayor

3.- CONCLUSIONES.

- Se tomó como referencia las "Normas Técnicas complementarias para diseño y construcción de estructuras de mampostería del distrito federal 2004" para compresión axial y compresión diagonal. Los resultados generados en la prueba a compresión diagonal son superiores a los encontrados en la norma de referencia de la tabla 2.9
- La flecha presentada en los ensayos carga-deformación cumplen, ya que no sobrepasan la flecha L/360, especificada en la norma NMX – C – 1997 – ONNCCE.
- La deformación residual cumple con lo especificado en la norma NMX – C – 1997 – ONNCCE. Donde nos indica que debe de resistir las cargas de 981 Pa (100 kg/m²), sin rebasar una flecha de L/360 L es la longitud del claro mayor y recuperarse de su deformación al retirar la carga.

Esperando que la información proporcionada sea para usted de la utilidad esperada, y atentos a cualquier aclaración que llegara a surgir al respecto, quedamos de usted enviando un cordial saludo.

ATENTAMENTE

Ing. Julio C. Conde Barajas
Jefe de Laboratorio

Ing. Iván R. Castañeda Campos
Jefe de Departamento

VALLEJO
INGENIERIA ESTRUCTURAL, S.C.

Zapopan, Jal. 4 de abril de 2018

ARQ. GISELA LEMUS
P R E S E N T E

Estimada Arquitecta:

Por este conducto informo a Usted la resistencia a carga lateral del sistema murotech en Kg/m2, de acuerdo con las pruebas realizadas en laboratorio, por parte de Ustedes.

Los resultados arrojan una resistencia de carga distribuida de 1,800 kgs/m2, aplicando factores de reducción apropiados nos daría una carga máxima de 1,080 kgs/m2, la cual es adecuada para los vientos generados por un huracán en la zona costera de Quintana Roo.

De acuerdo con los parámetros de diseño y la velocidad regional indicada por el reglamento de la CFE, nos daría una presión máxima de 250 kg/m2, en promedio para una velocidad de 163 kmt/hora, lo cual es resistida ampliamente por el sistema Murotech, si se toma en cuenta una velocidad de viento de 300 kmt/hora, que ya se han dado en la zona la presión máxima seria de 860 kg/m2, y sigue estando por debajo del esfuerzo resistente del sistema.

Con esto demostramos que el sistema de Murotech, es adecuado para los vientos antes mencionados.

Por supuesto se tendrá que revisar el proyecto de forma global y ver si existen elemento estructurales adecuados para este fin.

De surgir alguna duda de lo anterior le rogamos se comunique lo más pronto posible con nosotros.

Sin más por el momento quedamos a sus apreciables órdenes.

A t e n t a m e n t e

Ing. Alvaro Vallejo Narváez

EL CARMEN 1150-1 COL. CAMINO REAL C.P. 45040 ZAPOPAN JAL. TEL. 3647 0714 CEL. 333 167 0582

ANALISIS DE VIENTO		
Grupo	C	
Tipo	2	
Categoria	1	
Clase	B	
Periodo retorno	10	Años
FC	0.95	
α	0.101	
δ	245	
FT	1.1	
No. Obs.	31023	
VR50años	163	km/h
ASNM	8	mts
τ	25.4	° C
Ω	764	mm de Hg
z =	3.3	mts
cpe =	0.8	1.2
cpi =	0.2	0.3
KA =	0.9	1
KL =	1.5	HE> 25 mts

C. F. E DISEÑO POR VIENTO 1993		
VD =FT x Fα x VR	172	km/h
Fα = FC x Frz	0.959	
Frz =1.56 x (z/δ)^α	1.010	10 < z < δ
G =0.392*Ω/273+τ	1.004	
qz =.0048xGxVD^2	142	kg/m2
Pz =CpxKAxKLxqz	192	kg/m2
cp =cpe+cpi	1	

Z= 19.8

1.5

	Vr10	Vr50	Vr200	ASNM	Temp. Media anual
P. CARMEN	103	163	181	8	25.4

NIVEL	VD km/hr	Fα	Frz	qz kg/m2	PRESION kg/m2
N+3.3	172	0.959	1.010	142	192
N+6.6	184	1.029	1.083	164	221
N+9.9	192	1.072	1.128	178	240
N+13.2	198	1.103	1.161	189	255
N+16.5	202	1.129	1.188	197	266
N+19.8	206	1.149	1.210	205	276

ANALISIS DE VIENTO		
Grupo	C	
Tipo	2	
Categoria	1	
Clase	B	
Periodo retorno	10	Años
FC	0.95	
α	0.101	
δ	245	
FT	1.1	
No. Obs.	31023	
VR50años	300	km/h
ASNM	8	mts
τ	25.4	° C
Ω	764	mm de Hg
z =	3.3	mts
cpe =	0.8	1.2
cpi =	0.2	0.3
KA =	0.9	1
KL =	1.5	HE> 25 mts

C. F. E DISEÑO POR VIENTO 1993		
VD =FT x Fα x VR	317	km/h
Fα = FC x Frz	0.959	
Frz =1.56 x (z/δ)^α	1.010	10 < z < δ
G =0.392*Ω/273+τ	1.004	
qz =.0048xGxVD^2	483	kg/m2
Pz =CpxKAxKLxqz	652	kg/m2
cp =cpe+cpi	1	

Z= 19.8

1.5

	Vr10	Vr50	Vr200	ASNM	Temp. Media anual
P. CARMEN	103	300	181	8	25.4

NIVEL	VD km/hr	Fα	Frz	qz kg/m2	PRESION kg/m2
N+3.3	317	0.959	1.010	483	652
N+6.6	339	1.029	1.083	555	750
N+9.9	354	1.072	1.128	603	814
N+13.2	364	1.103	1.161	639	862
N+16.5	372	1.129	1.188	668	902
N+19.8	379	1.149	1.210	693	936

GUATEMALA

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INFORME DE ENSAYO RESISTENCIA A COMPRESION
AREA BRUTA - NTG 41055 h1

Acreditado
OGA-LE-052-13

Fecha impresión: 2019.12.12
Página: 1 de 1
Usuario: HHERNANDEZ1
OT: 37789-1
Fecha OT: 2019.12.09

Cliente: MUROTECH.CA	Proyecto: CONTROL DE CALIDAD MUROTECH.CA
Dirección: CONDOMINIO LA CAÑADA ZONA 14, 10AV. 22-26	Dirección: CONTROL DE CALIDAD MUROTECH.CA
Contacto: RODRIGO CACAHO	Muestra: MUROTECH
Teléfono:	Analista: HÉCTOR HERNÁNDEZ

No.	Id. Cliente	Identificación Especimen	Fecha Hechura	Fecha Rotura	Edad (días)	Masa (kg)	Largo (mm)	Ancho (mm)	Alto (mm)	Resistencia (N/mm²)	Resistencia (kg/cm²)
1	M-40CMX20CM	37789-1-01	2019.06.13	2019.12.11	181	4.81	398.000	75.000	200.000	3.685	37.576
2	M-40CMX20CM	37789-1-02	2019.06.13	2019.12.11	181	4.56	396.000	75.000	203.000	3.434	35.016
3	M-40CMX20CM	37789-1-03	2019.06.13	2019.12.11	181	4.88	398.000	75.000	201.000	3.290	33.548
4	M-40CMX20CM	37789-1-04	2019.06.13	2019.12.11	181	4.70	402.000	75.000	198.000	3.330	33.956
5	M-40CMX20CM	37789-1-05	2019.06.13	2019.12.11	181	4.70	393.000	75.000	201.000	4.468	45.560

FINAL Observaciones: MUESTREO REALIZADO POR EL CLIENTE.

Analista

Jefe Laboratorio/Coordinador

No. 25151 CETEC

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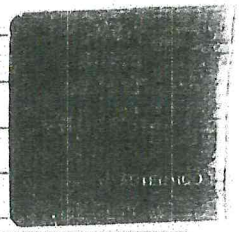
CEMENTOS PROGRESO, S.A.
CENTRO TECNOLÓGICO
15 Av. 18-01, zona 6 La Pedrera
Tel: 2286-4178 Fax: 2286-4181

INFORME DE ENSAYO RESISTENCIA A FLEXIÓN CON UN PUNTO DE CARGA - NORMA NTG 41087 h1

Usuario: HHERNANDEZ1
OT: 37789-3
Fecha OT: 2019.12.09

Cliente: MUROTECH.CA	Proyecto: CONTROL DE CALIDAD MUROTECH.CA
Dirección: CONDOMINIO LA CAÑADA ZONA 14, 10AV. 22-26	Dirección: CONTROL DE CALIDAD MUROTECH.CA
Contacto: RODRIGO CACAHO	Muestra: MUROTECH
Teléfono:	Analista: HÉCTOR HERNÁNDEZ



No.	Id. Cliente	Identificación Especimen	Fecha Hechura	Fecha Rotura	Edad (días)	Masa (kg)	Largo (mm)	Ancho (mm)	Alto (mm)	Módulo Rotura (N/mm²)	Módulo Rotura (kg/cm²)
1	M-24CMX22CM	37789-3-01	2019.06.13	2019.12.11	181	2.90	240.000	212.000	75.000	3.329	33.946
2	M-24CMX22CM	37789-3-02	2019.06.13	2019.12.11	181	2.96	238.000	220.000	75.000	3.581	36.515
3	M-24CMX22CM	37789-3-03	2019.06.13	2019.12.11	181	3.08	241.000	219.000	75.000	3.716	37.892

FINAL Observaciones: MUESTREO REALIZADO POR EL CLIENTE.

Analista

Jefe Laboratorio/Coordinador

CONTACT US

Any questions?

You can find us at:

www.usmurotech.com

MONICA PEÑA
+502 5203 1944
mpeña@usmurotech.com

NATALIA STEINHART
+502 5314-8064
nsteinhart@usmurotech.com