Presented By: Steve Marskell

FOUNDING DIRECTOR OF MAGNESIUM OXIDE BOARD CORPORATIONS GLOBAL GROUP OF COMPANIES

To many peoples surprise magnesia cements and the use of them in building and construction is

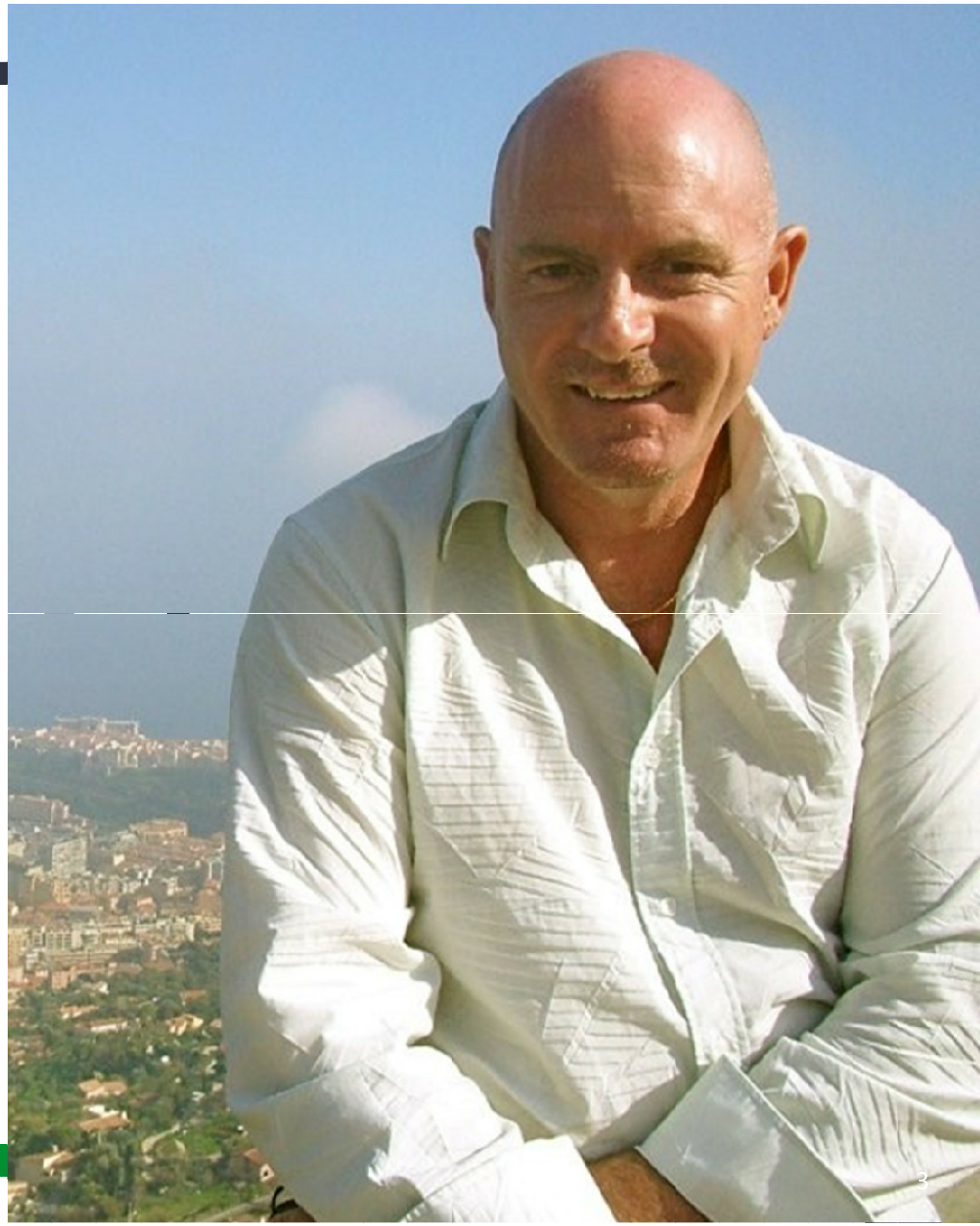
“NOT NEW AT ALL”

In the 21st Century we would be led to believe by industry experts, universities and academics alike that there is a new phenomenon breaking into global markets that will revolutionise building and construction as we know it.

These industry experts also are making rash statements that are causing nothing but confusion within the construction industry such as:

It is new technology **It needs more evaluation**

Don’t go near it **It has no proof of performance**



Well !!!! what the industries “laboratory” academic experts are saying could not be more further from reality …….than may be that of our politicians……. (but that is another topic)

This unknown innovative material is **Magnesia Cement**

Or is better known today as MgO / MgO Board, all of which regardless of its 21st Century Name has over 800 Years of documented history of successful use in building and construction.

SO HOW CAN THIS BE NEW ? – HOW CAN THERE BE NO PROOF OF PERFORMANCE ?

blends of magnesia cements have been used extensively throughout ancient times in Germany, France, Italy, Mexico, Latin America, Switzerland, India, China and New Zealand, among other countries.

History shows that Ancient European artisans used timber framing filled with magnesium oxide cement to construct homes.

Sometimes the magnesia cement had straw combined within the mixture to allow them to gain better all year round thermal performances from the heat and cold as well as to add bulk to the infill mixture…..

Also many of the Stupas including THE GREAT STUPA in Sanchi India and The PANTHEON in Rome were all made with magnesium-based cements and are still standing today.

Believe it or not “there are still no gaps visible in these 800 - year - old walls and buildings that still remain standing and operable in 2020”

Early magnesium cements were made with soluble phosphate from animal faeces or fermented plants and magnesia and optionally clays.

"These natural magnesia mud cements bind naturally and exceptionally well to all cellulose materials (i.e. plant fibres, wood chip, etc.) and where often referred to as “living cements”

”This is in sharp contrast to the Portland cement of today, which repels cellulose”

The statement **“It Never Goes Out of Fashion”** can be applied to the on again off again evolution and status of magnesia cement (MgO) based products.

The global construction materials industry, historically is based on an extremely wide range of materials such as Drywall / Plasterboard / OSB / and Fibre Cement (FC), all of which came to fame in the later half of the 20th century as common use materials within the construction industry of which Portland cement (PC) has been the more dominant material.

All said and done regarding the abilities of magnesia cement, the **BIG QUESTION STILL LINGERS…….**

- ARE ALL Magnesia Cement Boards Made Equal
- Do They All Perform The Same
- What Types of Magnesia Cement Boards Are There
- What Proof Is There That Supports Various Claims of Performance

THE SIMPLE ANSWER IS: NO

NO <u>THEY ARE NOT ALL MADE EQUAL</u>

NO <u>THEY DON'T PERFORM THE SAME</u>

THERE ARE AT LAST COUNT SIX (6) TYPES

1: MgO Chloride (MgSO4) Activated Board (oldest and longest proven history of performance)

2: MgO Silicate Board (most used form of magnesia cement board)

3: MgO Portland Mix Board

4: MgO Phosphate Board

5: MgO Plaster Mix Board

6: MgO Sulphate (MgCl) Board (the most unstable of all MgO Boards)

COMPARATIVE ANALYSIS OF THE OLDEST TRIED AND PROVEN FORMULATION OF MAGNESIUM CEMENT (MGSO4) BOARD (45YRS) VS THE CLAIMS OF THE NEW (5YRS) SULPHATE (MGCL) BOARD

Example #1

Performance Chart:		XXXXX panel (Sulphate) Board Report #171228005SHF-BP-2-R1		Vs	ResCom™ Board SGS and Intertek Laboratories	
Technical Spec	**Test Method**		**Result**			**Result**
Thickness		10mm			10mm	
Flexural Mpa	AS/NZ 2908 Sec 8.1.2.1	13.2		C1185-08	22.9	
Moisture Linear	ASTM C1185 8 Sec 8	0.18			0.064	
Humidity Deflection	ASTM C473-12	No Test Report	?	C473-12	2.64	
Water absorption	ASTM C1185-8 Sec 8	No Test Report	?	C1185-08	12.8	
Water Permeability	AS/NZ 2908 Sec 8.2.2	What Category	?	EN12467		Pass
Water Vapor	**EN12467 (F) Sec 5.4.6**	No Test Report	?			**Pass**
Category A	EN12467 (E) Sec 7.3.4					
Freeze Thaw	**EN12467 (F) Sec 5.5.2**	No Test Report	?		**RI = 0.90**	**Pass**
Category A	EN12467 (F) Sec 7.4.1					
Heat Rain	**EN12467 (F) Sec 5.5.3**	No Test Report	?		**No Damage**	**Pass**
Category A	EN12467 (E) Sec 7.4.2					
Mean Density	AS/NZ 290 Sec 8.1.2.2	1			0.9	
Ball Impact	ASTM D1037-12 Sec 21	950mm Height	Broken		3000mm Height	Not Broken
Screw Pull Out	ASTM D1037-12 Sec 16	446(N)		ASTM E386	3845 (N)	
Lateral Nail Pull	ASTM D1037-12 Sec 13	No Test Report	?		1450 (N)	
Nail Pull Through	ASTM D1037-12 Sec 15	No Test Report	?		517 (N)	

Example #2

13/06/2019

SUMMARY REPORT Multi Board (M4) vs ResCom (HMR)

MgO Corp Asia Laboratories comparative test analysis has been carried out by request of [redacted] All testing has been carried out under international standards in a controlled laboratory environment to assure direct equal comparisons to be applied to each product.

Test	Product	Result	Product	Result	Direct Comparison			
	Multi Board M4 (12mm)		ResCom Board (12mm)		Variation Between Products			
Sample Size	8" x 8"		8" x 8"		Risk to Built Environment			
Formulation	Magnesium Sulphate MgSO4		Magnesium Chloride MgCl2			M4	vs	HMR
Chloride Content		4.30%		1.95%		High	vs	Low
Water Absorbtion		21%		13%		Medium	vs	Low
Moisture Content		>9% to 13%		3.20%		High	vs	Low
Dry / Wet Density	Natural State	1.0g/cm^3	Natural State	1.09g/cm^3		Similar	vs	Similar
Wet / Dry Density	After Drying	0.89g/cm^3	After Drying	1.08g/cm^3		11% Drop	vs	Stable
Av Thickness Error	Thickness of 4 Sides	7.30%	Thickness of 4 Sides	0.25%		High	vs	Low
Dry Strength MpA	Natural State	12.22MpA	Natural State	21.19MpA		Low	vs	>57.6%
		10.65MpA		20.17MpA		Low	vs	>52.8%
Wet Strength MpA	After Soak Test	10.98MpA	After Soak Test	19.35MpA		Low	vs	>56.7%
		10.94MpA		17.63MpA		Low	vs	>62%
Residual Release	After Soak Test	Salt to surface	After Soak Test	Nil		High Risk	vs	Low
Soak Dry Deformation	Risk of Deformation	High	Risk of Deformation	Low		High Risk	vs	Low

The attached reports and the above summary raises serious concerns surrounding the representation and statement of performances made by Multi Board (M4) as displayed on their website and throughout the technical data. MgO Corp has always expressed that the MgS04 formulations are unstable, unproven and not suitable for use within the building and construction industry as an exterior or interior wall, ceiling, flooring or cladding product. Our company has been monitoring for some time now the introduction of MgCl2 into the sulphate mixtures by the sulphate board manufacturers as they try to overcome the lack of integrity and performance of the MgS04 products.

Example #3

MgO Corp Asia Laboratory Test Results		Specimens where prepared at in Lab equilibrium conditions		
Test Sample 1:		[redacted] **RD**		**9mm Comparison**
1: Chemical Composition		Sulphate + Binder		MgO Chloride + Binder
2: Residual Chloride Ion Content		0.92%		1.96%
3. Dry Weight		469.5g		674.3g
4: 24hr Water Absorption 27°c		22.80%		17.80%
5: MpA Dry Weight Strength		7.46		25.86

Test Sample 2:		[redacted] **RD**		**9mm Comparison**
1: Chemical Composition		Sulphate + Binder		MgO Chloride + Binder
2: Residual Chloride Ion Content		0.92%		1.96%
3: Dry Weight		529.7g		710.0g
4: 24hr Water Absorption 100°c		21.50%		12.40%
5: MpA Dry Weight Strength		7.46		25.86

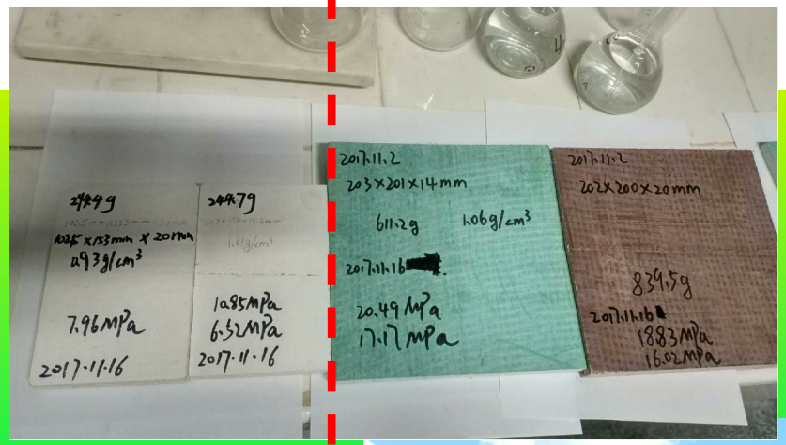
Note* Testing was carried out in accordance to international testing protocol as details under ISO 8336.1993 for that of Fibre Cement Flat Sheet Products and adopted for Magnesium Oxide Board. Standard References: AS/NZS 2809 & 2809.2, EN12467:2012, ASTMC1186-082012

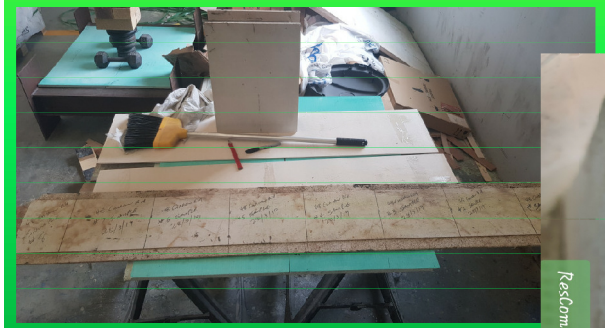
Full care was taken to prepare the test samples marked [redacted] and comparison test sample marked MgO Corp to be that of an equilibrium state prior to the start of testing.

All results are tabled in good faith to the client as to the show of the comparison between products and at no time should be considered as the sole or singular element or cause of the issues found within the building located at [redacted] Road Burpengary

The above examples start to highlight the major differences of magnesia cement boards and the importance of assuring that the correct formulations, quality of raw materials, manufacturing processes and independent 3rd party QA is carried out to lessen both the long and short term risks associated with buying a product that does not carry the level of proven performance and protection a project needs.

THE GOOD – THE BAD & THE UGLY TRUTH FILE





The Not So Good Side ⟵ ⟶ The Good Side

THE GOOD – THE BAD & THE UGLY TRUTH FILE

Common Manufacturing Facility

VS

Modern HiTech High Performance Manufacturing Facility and QA Processes

AS I HAVE SHOWN
"THE MAGNESIA CEMENT INDUSTRY HAS BEEN AROUND FOR OVER 800YRS"
SO WHY HAS IT NOT GROWN TO THE STATUS OF OTHER LEADING INDUSTRY PRODUCTS

This I believe is due to some of the following reasons:

1: Modern Day Groups are continually reinventing the wheel without respect or understanding of the proven science and complexity of making a high performance product.

(They just think because it does not burn it is fine and it will fix the problems)

2: Supply companies are trying to compete with entry level plasterboard and the FC sheet industries, which results in cheap inferior products coming into the market based on low pricing points

(not performance)

3: There is confusion within the MgO Industry to what is a good and what is a bad MgO Board. This starts with the companies sourcing the products, because they are only prepared to pay the cheapest price to the manufacturer.

(you get what you pay for)

4: Focus on propaganda surrounding rust and corrosion over the past 5yrs has led to the fast track of inferior MgO based products such as Sulphate Boards, without any consideration of test data that refutes the supplier and trading house claims

(to stop the BS we are happy to share this information with everyone)

5: A lack knowledge and understanding of the application of the products within the construction industry.

(where are the independent engineering, testing, compliance certifications and installation reports)

(more than ever our industry need clarity and support to assure our building are protected)

6: Industry suppliers trying to write their own internal standards

(EG: UK and MOCA from CANADA) for the use of Magnesia Cement boards to bolster their position instead of allowing governments to independently champion such standards like already exist in America under the ICC-ES Magnesia Cement Flat Sheet of which China adopted as industry best standards in late 2018

(there are already trusted 3rd Party Independent Laboratories and Agencies we can all trust)