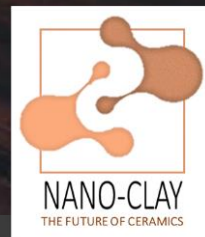


MODERN MATERIALS

SALES & SPECIFICATIONS GUIDE



PHOMI



UPHO

PHOMI GROUP

Modified Clay Material MCM – Nanoclay Technology
Their Vision, Our Vision, Your Vision



Environmental Wellbeing and Human Wellbeing

As our world outside continues to make progress in becoming a healthier environment, driven by the collective efforts of the Green Movement. The focus on our world inside is also making progress. The Human Centric movement is focused on making our indoor environments healthier mentally, physically and emotionally. Our manufacturer PHOMI Group has made it their mission to manufacturer products through responsible, sustainable, energy efficient, low carbon and nearly zero waste processes. Clay is an abundant material that requires no destructive mining and because its non-fired uses low energy and releases no harmful carbon emissions.

But that is only part of the story as PHOMI is paving the way to the possibility that the walls, floors and ceilings that encapsulate the environments we spend the most time in can also help make those environments healthier. PHOMI Groups patented Modified Clay Material (MCM) products will help make your home, office and public and social spaces healthier, more efficient and safer without sacrificing beauty, innovation or design. MCM is also installation friendly as it is thinner, lightweight, flexible and easier to work with than other stone or ceramic materials. PHOMI Group manufacturers in a country that is leading the world in renewable energy and quickly becoming a world leader in sustainability according to an articles in Forbes by Erik Kobayashi-Solomon, Aug 21, 2019

Its time to expect more from our surface materials.





Table of Contents

Inspiration

Innovation 3

Revelation 4

Inspiration 7

Technical 10

Coming Together

Build 13

Care 20

Warranty 21

A surface that truly innovates.

INNOVATIVE • SUSTAINABLE • DESIGNABLE • DURABLE • VERSATILE • HIGH FUNCTIONING

ENVIROMENTALLY FRIENDLY • HUMAN FRIENDLY

WALLS

CEILINGS

INTERIOR / EXTERIOR

FLOORS

Create Spaces That Create Healthier Spaces!

US Patent NO: 8,505,840

PRODUCTS

Wide variety of textures and colors available.

Click on each of the collections to find out more.



MCM STONE

The look of natural stone without the damage created by quarrying.



MCM BRICK

The same look and durability of kiln-fired brick, but without the kiln or the weight



MCM WOOD

We make wood, but better and without cutting a tree.



MCM Leather and Fabrics

Replicate the look of wildlife or nature in the most sustainable ways.

WHY MODIFIED CLAY?

NON-FIRED NANO CLAY

PHOMI GROUP is committed to sustainable, environmentally responsible manufacturing; non-fired production consumes 70% less energy than traditional fired products, lightweight = less freight.

Since ancient times, using clay for construction has proven to help regulate building's temperature and humidity. The product is made of 95% inorganic clay material and 5% other minerals, polymers and only natural thru-body pigments that are environmentally safe, UV- stable, recyclable and fireproof.



The impossible just keeps getting more possible...

Our products are thin, lightweight, flexible, extremely durable, and highly functional! They can be installed almost anywhere and are perfect for time-saving renovations by permanently covering old surfaces without the need for expensive demolition. MCM is innovative, versatile, design adaptative and allows you to create with almost no limitations.

Transform your spaces quickly, confidently, and economically!



Product Benefits



THIN & LIGHT



WATERPROOF



INSULATIVE



DURABLE



FIREPROOF



UV STABLE



FLEXIBLE



IMPACT RESISTANT



NO-DEMOLITION

Ecological material function

Clay has the great ability to absorb and release moisture from the indoor air thus stabilizing humidity inside rooms to prevent mold and providing a healthy living environment.

Clay are completely breathable and have the ability to absorbs toxin and odours from indoor air.

WELLNESS BENEFITS



HUMAN CENTRIC PRODUCTS

The term GREEN which represents “Environmental Wellness” is quickly becoming just part of the story in creating a better environment. As we continue to focus on our wellbeing, we recognize simply working on our own health is not enough and the outdoor environment is not the only environment effecting our health. Wellbeing is extending into all aspects of our lives. “According to The Global Wellness Institute”, the wellness industry has grown to over \$4.2 Trillion primarily in activities that promote physical and mentally wellbeing.” But that is quickly changing as wellness is now permeating into the global consumer conscience in all areas of our lives including where we live and work. The building industry is moving towards Human Centric products, designs and technology to improve our indoor environments. Manufacturers are looking beyond just efficiency they are working on technology that helps promotes physical and emotional health and overall wellbeing. What does Human centric technology focus on?

Lighting • Thermal Comfort • Moisture / Humidity • Noise • Design • Indoor Air Quality

INDOOR ENVIROMENTAL CHALLENGES

Today more than ever we are spending time living in indoor environments. A recent report backed by data from international research firm YouGov highlights how much time people are spending indoors: research has found that around 90 percent of people spend close to 22 hours inside every day.

Humans were meant to spend time outdoors, but by spending more time indoors we lose physical, mental and emotional health benefits of being outside. Spending too much time indoors comes with its own set of problems; like too much artificial lighting. Some problems (as shown below) work together to create an unhealthy environment



Exposure to disproportionate amounts of Positive Ions (Cations) – efficient or not we are bombarded electrical energy by appliance, TV’s, computers, which are the main source of all the positive Ions we are exposed to indoors.

+

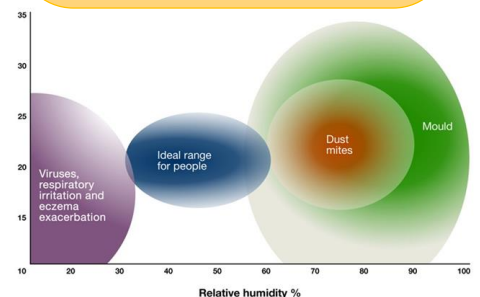
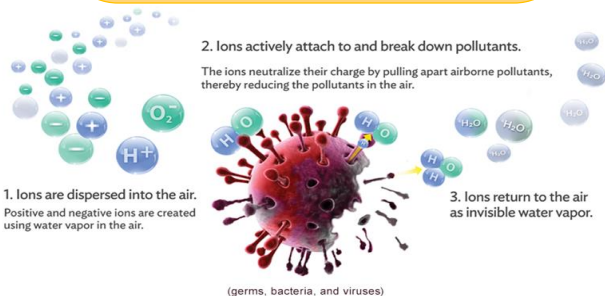
Poor air quality – if you don’t have air filters, you are one, we breath over 4000 gallons of air daily. Our indoor air carries dust, toxins, mold, spores, bacteria, viruses, dander, even formaldehyde are carried in particles that are charge with Positive Ions

+

Poor Relative Humidity, too high or too low - the ideal environment for the airborne pollutants and toxins to survive carried by the air we breath. Poor relative humidity can worsen breathing problems such as asthma



Our bodies are constantly bombarded with positive ions brought about by our modern ways. We have created a positive ion prison for our body as we are surrounded by air conditioning, electrical equipment, television, computers, and other devices, not to mention air pollution.



HUMAN CENTRIC SURFACES

When being indoors feels like your outdoors!



AN UNLIKELY SOURCE

PHOMI Modified Clay is born from science with the drive to innovate, a passion for design and technology and environmental responsibility. The science behind clay nanoparticles that developed technology in other industries like health and medicine was used in developing their Patented Modified Clay Material. Utilizing the natural properties of clay; absorbency and de-absorbency, breathability, antimicrobial, UV stability, adding other minerals and polymers to enhance those properties and a proprietary method of production PHOMI was able to create the most innovative, versatile and perhaps only human centric surface. If we think about technology to make our **homes or workplace healthier environments**, we don't think about wall coverings, flooring, ceilings, paint, tile or other surfaces... until now. Now the spaces we create that benefit our emotional wellbeing can equally benefit our physical and mental wellbeing.

APPLYING TECHNOLOGY

Air Quality / Breathability

as air flows through the material its bacteriostatic properties will help eliminate bacteria, germs and other toxins. This compounded with other MCM properties helps improve overall air quality.

MCM releases negative Ions

(Anions) MCM releases negative ions, by adding Tourmaline it increases the effect. Negative Ions released in the air attach themselves to positive charged ion particles dust, mold, mildew, bacteria, odors and other toxins rendering them harmless. The Negative Ions absorbed through skin and when we breath, is known to have physical and mental health benefits by neutralizing the increased Cations in our body produced by our indoor environments.

Thermal MCM has low thermal conductivity and insulative properties which will help keep your home more energy efficient.

Antistatic – MCM has antistatic properties which is ideal for safer industrial or workplace environments. This property has a cleaning effect as it prevents dust from accumulating on the material.

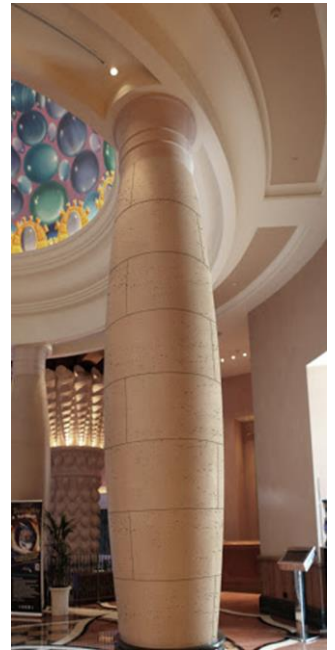
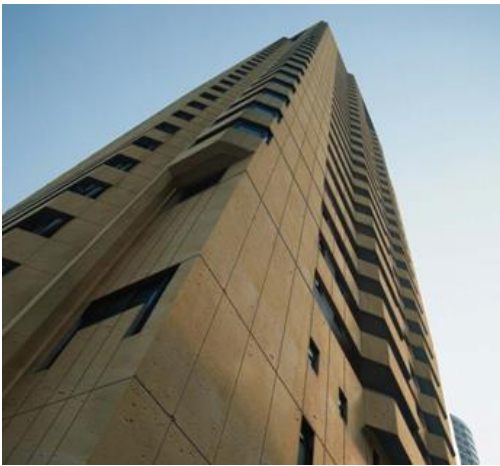
Regulate Relative Humidity

the natural absorbency and de-absorbency of clay helps regulate relative humidity to optimal levels. At these levels mold, mildew, bacteria, germs cannot survive. At optimal RH levels asthma and allergies problems are reduced. Additionally, with the release of moisture when exposed to sunlight, far IR waves released by MCM offer benefits to both humans and the environment.

Good for THE environment is now good for YOUR environment.



- Outdoors
- Indoors
- Columns
- Ceilings
- Floors



For Almost Any Project

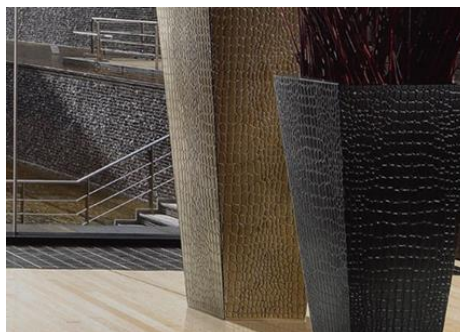
Modified clay will open doors to many projects, many environments. From floor to ceiling, inside or out there isn't many applications our products aren't suited for. Just as important is Nano-clay's ability to make those projects better. Whether it's modified the natural self-cleaning, flexibility or blocking radiant heat, there are almost always a secondary benefit that no other surface material can offer.

DESIGN WITHOUT LIMITATIONS

Do your products inspire your designs or do you find inspiring ways to use them? Have you ever adapted your designs to the products available? When is the last time you looked at a product that offered so many unique advantages and applications? Designs that inspire, that function and that help make healthier environments; that's the PHOMI advantage.



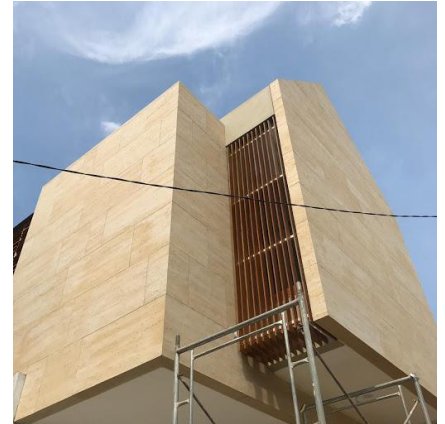
- Restaurants
- Bathrooms / Showers
- Retail
- Furniture and Specialty Applications



Our bendability gives you flexibility. Water absorption is still water resistant. Nanoclay is perfectly suited for offices, bathrooms, showers, homes, restaurants, hotels or wherever your designs take you. Whether you need to match, mimic or even create your own custom patterns or design our material is fully customizable. It is available from large format 110"X 48" to small 3"X 6". Our products let you take creativity to an all new level and without creating levels of problems. With any project our material will make the installation easier, faster and overall less expensive.

DESIGN WITHOUT LIMITATIONS

Where you see an amazing slate pool deck, we see a softer to the touch, cooler, slip resistant surface that requires no special maintenance and is highly chemical resistant. Our material is ideal for pools, hardscape, other outdoor applications and is perfectly suited as a replacement to dull stucco.



- Hardscape
- Pools
- Facades
- Alternate to Stucco / Siding / Stone

Easy to Install

Where you see a beautiful fitness center with beautiful but risky wood or porcelain flooring and accents. Not to worry its not actual wood, in case you accidentally dropped your weights. We see a quieter, healthier, less-odorous and more comfortable space to focus on your wellbeing. Clay is temperature neutral and doesn't absorb heat like stone or brick. Its thru-body natural color means it won't be harmed by the sun's powerful rays. The natural breath-ability, absorption and de-absorption allow it to filter the air and help regulate humidity to optimal zone which makes the room feel more comfortable. At optimal zone bacteria, viruses, germs, even those that carry orders cannot survive. Welcome to Human Centric Surfaces.



- Hospitality
- Institutional
- Medical / Healthcare
- Municipalities / Schools
- Large Commercial Spaces



Easy to Install

Our modified clay is also available in different installation options such as interlocking or self-adhesive (peel & stick).

Its high capacity to adhere allows the installers to use different types of adhesives for different applications. Our material is easy to cut, whether you use a wood blade, diamond blade or razor blade to score and snap cutting it is quick and accurate. You can even miter-cut the nanoclay to create a solid finished look with minimal visible seams.

No special tools are required and there is no polishing. There is no need for certification or special training.

Modified Clay Material Specifications

Product Specifications		
Material Composition	Modified Clay Material	
Installation	Acrylic Adhesive or Equal	
Patent	United States patent No. 8505840 / European patent No. 2157139	
Test Data		
CE Certificate	EN 15102:2007+A2:2011	Compliant
Fire Rating	ASTM E84-15/EN 13501-1+A1:2010	Class A
Freeze-Thaw Cycling	ASTM C1026-13	Weight Loss - 0.42% Appearance – No visible change
Water Absorption	ASTM C97/C97M-15	12.4%
Bulk Specific Gravity		1.83
Stain Resistance	ANSI Z124.6-2007 Clause 5.2	Total Rating: 7.6 Max Stain Depth: 0.101 mm
Chemical Resistance	ANSI Z124.6-2007 Clause 5.5	No visible change
Abrasion Resistance	ASTM C241/C241M-15	Total Score: 8
Static Coefficient of Friction	ASTM C1028-07	Dry Condition: 1.11 Wet Condition: 0.70
UV – Light aging Exposure	ASTM G154-12a Cycle1 ASTM D2244-154 ASTM 2616-12	Gray Scale 4.0
		ΔE^*_{ab} 2.6
Chemical Composition		
PVC Free		None Detected
Phthalate Free	EN 14372:2004	None Detected
Respirable Crystalline Silica Compliant	OSHA Silica Rule	Clay not part of substances of note in OSHA standard
SVHC - Substances of Very High Concern (151 substances)		None detected – REACH Compliant
VOC – Volatile Organic Compounds		None Detected – Class A
Safety Data Sheet - SDS	Prepared in accordance with US Regulation 29 CFR 1910.1200	
Additional Test Data and Certifications		
Vinyl Chloride Monomer	EN 12149:1997 Test B	PASS
Heavy Metals and Specific Elements	EN 12149:1997 Test A	PASS
Thermal Resistance	EN 12667 (2001)	/ ½" = ½" Styrofoam Insulation
Thermal Conductivity		/ Very Low
<ul style="list-style-type: none"> • UNI EN ISO9001 International Standard for Quality Management Systems 		
<ul style="list-style-type: none"> • UNI EN ISO 14021 Products Containing at least 30% of post-industrial recycled material in bulk (LEED 30) 		
<ul style="list-style-type: none"> • UNI EN ISO 14021 Products Containing at least 30% of post-industrial recycled material in bulk (LEED 30) 		
<ul style="list-style-type: none"> • UL GREENGUARD GOLD Certified 155948-420 2.5-10mm Modified Inorganic powder composite building material 		
<ul style="list-style-type: none"> • Member World Green Building Council 		

Feature and Benefits Hierarchy

Design Features and Benefits

Feature	Flexible	Colors	Patterns	Texture	Customizable
Benefit	Versatility and innovation in design - Extrinsic / Emotional				
Seller					
Designer					
Contractor					
Owner / Customer					



Functional Benefits

Feature	Light Weight	Ease of Fabrication	Ease of Installation	High Adhesion	Handling & Storage	Durable	UV Stable	Chemical Resistant	Overlay Applications
Benefit	Time and Cost Savings - Intrinsic / Financial								
Seller									
Designer									
Contractor									
Owner / Customer									

High Function Features and Wellness Benefits

Feature	Fire Resistant	Antimicrobial	Anion / Air Detoxification	Sound Absorption	Regulates Relative Humidity	Antistatic	Resistant to Temperature Change	Hydrophilicity	Sustainability Eco-Friendly
Benefit	Healthier, Safer, Environmentally friendly - Intrinsic / Extrinsic Emotional / Logical								
Seller									
Designer									
Contractor									
Owner / Customer									

Project Cost Analysis (Time + Materials + Scope)

Average Cost

LOW	MEDIUM	HIGH
-----	--------	------

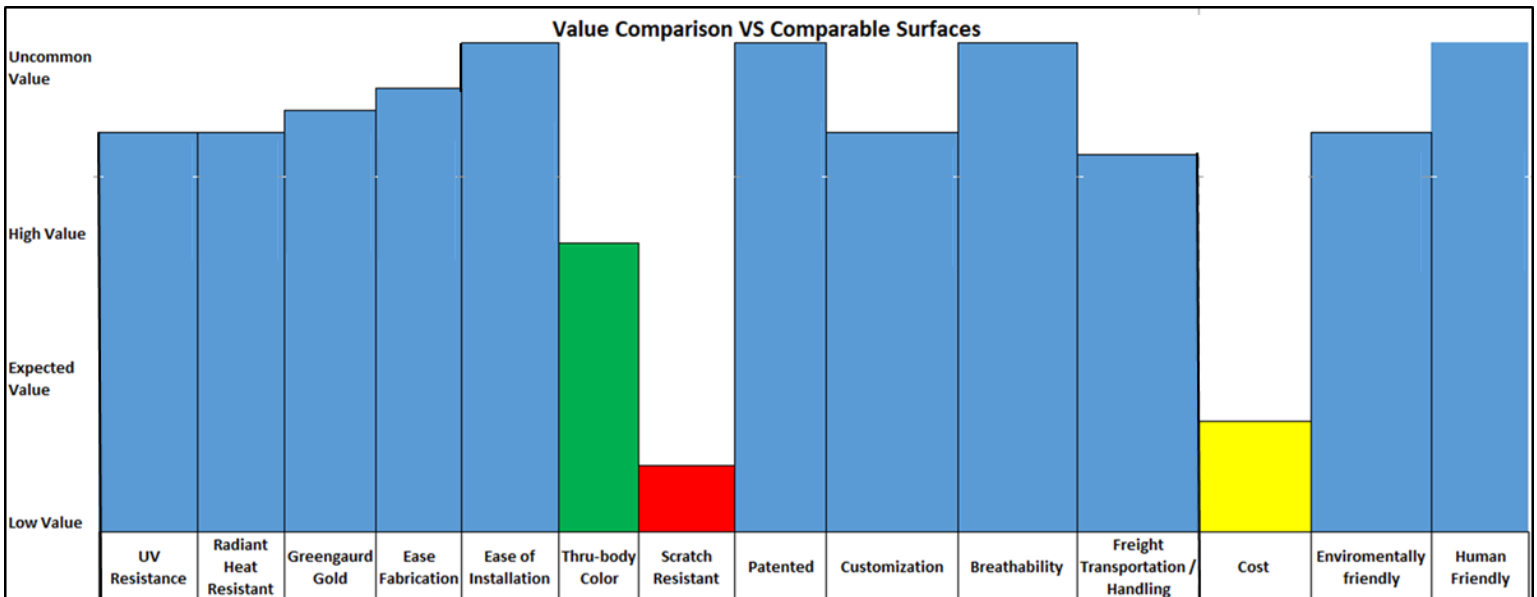
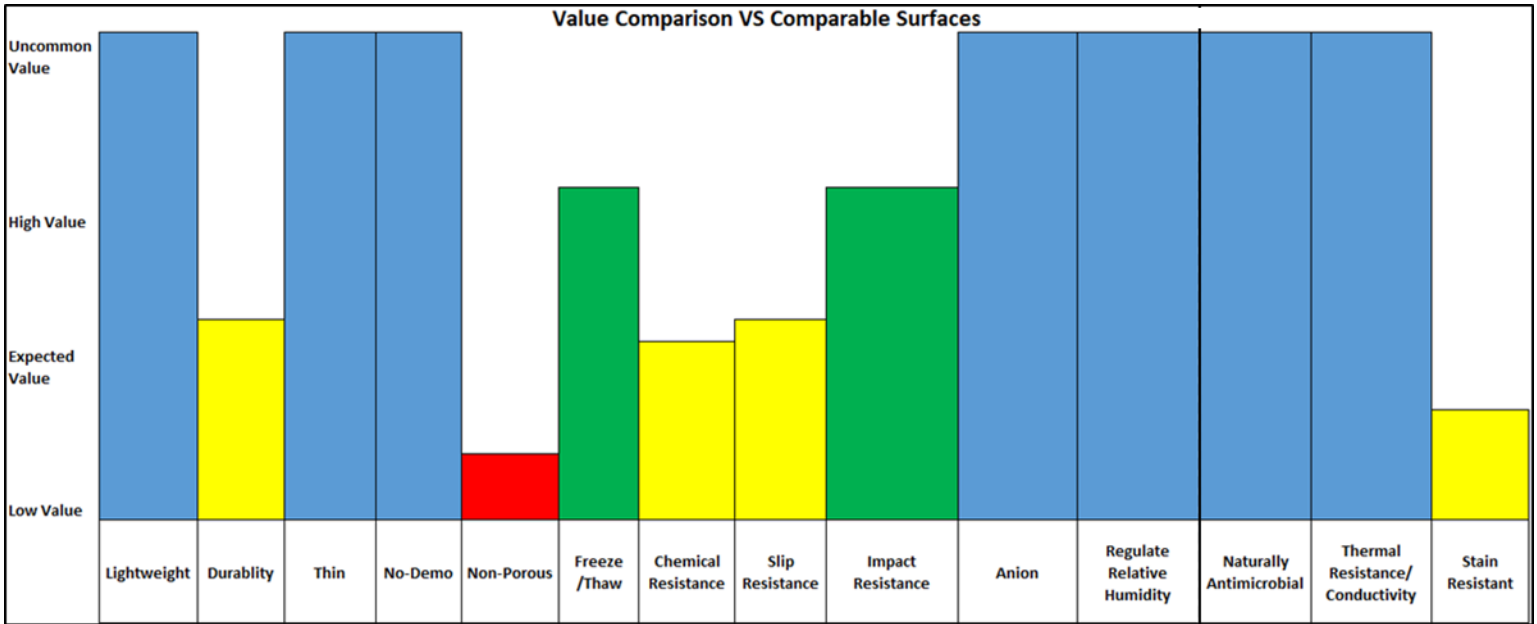
*MCM - Sizes range from mosaic to large format panels 110" - 48"

Product Acquisition	MCM	Vinyl / Engineered Flooring	Brick / Stone	Ceramic / Porcelain	Wood	Mosaic	Large Format	Granite Slab	Quartz Slab	Marble Slab	Semi-Precious
Material Cost	MED	LOW	MED	LOW	MED	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Freight	LOW	LOW	MED	MED	MED	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Storage	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Handling	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Transport	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH

Fabrication Installation

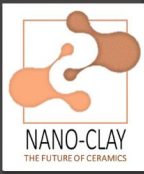
Tooling	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Cutting	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Edging	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Adhesive/ Consumables	LOW	LOW	LOW	LOW	MED	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
Handling	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Dust	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH
Noise	LOW	LOW	MED	MED	LOW	MED	HIGH	HIGH	HIGH	HIGH	HIGH

Product Value Comparisons



MCM – NANO-CLAY Features and Unique Differentiating Characteristics

✓ Heat Resistant	✓ Stain Resistant	✓ Indoor/ Outdoor Use
✓ Fire Resistant	✓ Hydrophilicity	✓ Ease of Fabrication and Installation
✓ Flexible	✓ Noise Reduction	✓ 70 Year Life Cycle Tested
✓ Lightweight, less freight	✓ Insulative Properties	✓ Zero Waste manufacturing
✓ Thru body color	✓ Antistatic	✓ Mold / Mildew Resistant
✓ UV Resistant	✓ Patented Technology	✓ Air Filtration / Detoxification
✓ No Demo Install	✓ Thin ≥ +/- 8mm	✓ Crack Resistant / Impact Resistant
✓ Bacteriostatic	✓ Impact Resistant	✓ Helps Regulates Relative Humidity
✓ 95% Inorganic	✓ Slip Resistant	✓ Environmentally Friendly – Human Friendly



PHOMI



Modified Clay / NANOCCLAY Fabrication and Installation Guidelines Horizontal and Vertical Applications



Overview

One of the best features of modified clay is the ease and versatility of fabrication and installation. Anyone who is skilled-in-the art of carpentry, stone fabrication, tile installation or building in general will find Nanoclay simple to fabricate and install. Best Practices and methods of tile installation apply to the modified clay. Modified clay requires no special tools or expensive equipment. It can be fabricated either wet or dry. It has a high adhesion strength which accommodates most adhesives. With a little creativity and imagination, you would be amazed at what you can create with this product.

Material Handling / Storage



<p>Large Format General Information</p>	<ul style="list-style-type: none"> • Lightweight – Approximately 1Lb. / sqft • Height up to 110" • Width up to 48" • Thickness \geq +/- 8mm
<p>Material Handling</p>	<ul style="list-style-type: none"> • Crate - For large format material longer than 6' use forklift extenders minimum 6' when off loading crate. • Large format panels can be rolled for transportation or carrying. • When rolling panels keep protective film on panel. • When unrolling or handling allow the material to acclimate and unroll itself. The material compresses when rolled, forcing the material flat could result in compression gaps / cracks.
<p>Storage</p>	<p>Nanoclay slabs should always be stored flat.</p>
<p>Preparation</p>	<p>When preparing material for installation be careful when material is below 60° degrees Fahrenheit. Do not to allow the material to bend, until it has warmed up to 80° avoid small cracks. Modified clay is an Elastomer nanocomposite like rubber it is less flexible in colder temperatures; especially larger format panels.</p>

Cutting

Blades	Almost any type of blade can be used to cut Modified clay, even a hand saw, but dry cut diamond are recommended for long term use. Modified clay contains sand and other mineral which will dull even carbon blades much quicker than diamond blades. When cutting with power tools always use a vacuum to help collect dust.
Razor	A razor is suitable for scoring and snapping thinner Nanoclay material. However, this is only advisable for making a few cuts as it will quickly dull the blade.
Circular Blades	General purpose circular blades for circular saws can be used but will dull rather quickly. You can reverse install the blade to prevent dulling.
*Circular Diamond Blades	Diamond blades are considered “Best Practice” and should be the primary blade for cutting. Continuous rim or J-Bade (continuous) rim with small spacings) are the best way to cut. Diamond blades are by far the safest blade to use as they aren’t cutting the material but grinding through the material. You can use them wet or dry. However, if dust is present wet cutting will all but eliminate that. Diamond blades are sold in all size blades with arbor sizes that will fit most any saw.
Jig Saw Blades	They make diamond Jig Saw blades, but metal type blades (smaller teeth) work well and are less expensive.
Roto –Zip Dremel	Both Roto Zip and Dremel Tools have diamond blade options. For occasional use the normal blades will do the job. For longer use you may consider diamond. Diamond blades will last a very long time.
Drill Bits	There are many different types of drill bits; carbon, cobalt, titanium, masonry, diamond. Any of these are suitable for drilling Nanoclay.
Hole Saws	General purpose hole saws work well. Diamond hole boring bits also work, but they are expensive and require a jig to prevent them from “walking”. Paddle bits also work but be careful when using.
Table Saws	Table saws are excellent and there are diamond blades for just about any size. When cutting miters for finish work, you must use a material hold-down, so the material remains flat on the cutting table. Other wise your miter cut will be uneven.
Circular Saws	Circular saws are excellent with diamond blades.
Tile Saws	Tile saws work great but when using water you will need to allow the material to dry prior to installing.
Miter Saws	Chop saws as some people refer to them with diamond blades are an excellent way to ensure good square cuts, especially for production.
Track or Rail Saws	A track saw utilizes a circular saw, that rides in a track to ensure straight cuts. When making miter cuts the material <u>must</u> be perfectly flat or the cut will be poor quality and unusable.
Bridge Saws	If you have a bridge saw it will certainly cut thru Nanoclay.
Water Jets	Water jets will cut just about anything but are best suited for intricate cuts that only they or a CNC machine can do.
CNC	Computer Numerical Control machines in our industry are normally for wood or Stone. A CNC for cutting stone would be almost impossible to use unless you glued it to a piece of stone due to flexibility of material. A CNC for wood will work but check with the manufacturer regarding bits and minerals.

Fabrication

Cutting
Mitters
90°
Corners

The nicest finish corners are outside corners 90° finished corners. **(Picture 2)** These finished corners create the look of a solid piece of material. 90° corners are made by making 45° cuts on two pieces, then gluing them together. Outside and inside corners can be miter cut for 90° corners. MCM can be finished at other angles such as 45° bevels. In fact most any inside or outside corner can be made, it just comes down to math. When cutting miters or other angles it is critical to make sure the material is flat prior to cutting. **(Figure 1)**

Taping
Gluing
Mitered
Joints

When gluing mitered 90° corners the final look is predicated on how tight the two corners are glued together. Taping is critical **(Figure 3)**. There are many types of tape but avoid high residue tapes. Tape first then material then glue. Refer to **Fabrication Adhesives** for glue information. MCM is thin and does not require large amounts of glue. When gluing move quickly as the glue can cure quickly. Remove the tape when the glue is about 70-75% cured. The corner will be bonded, but the excess glue will be “gummy” and easily removed with a plastic scraper. Do not allow the build up of excess glue in the inside corner. Scrape out excess glue with a slightly chamfered stir-stick to allow a small amount of glue in the corner to strengthen the edge. **(Figure 2)** Some fabricators prefer a gloved finger to remove excess glue. Always test the glue first as temperature and humidity may effect cure times. When glue is 70-75% cured remove tape, this prevents excess residue. Any excess glue also be removed much easier. If glue is not partially cured, stop and wait to avoid joint from opening. **(Figure 4/5)**

Finishing

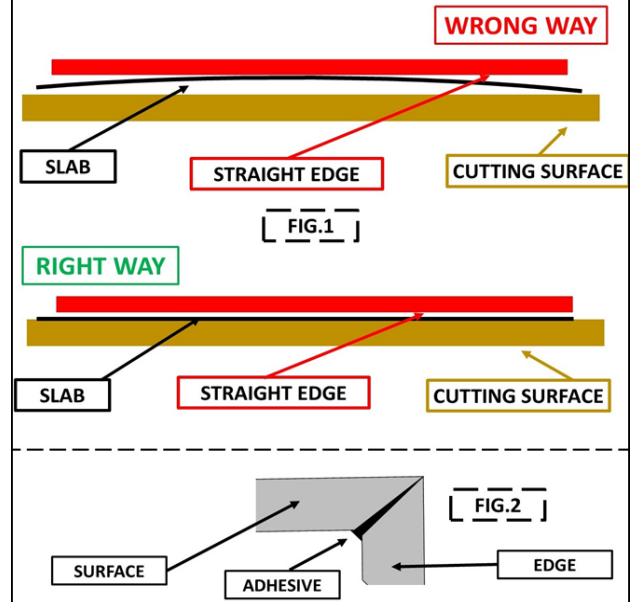
The only finishing is light sanding on the edges of cut lines or outside mitered corners. Light sanding using 150- 220 grit sandpaper is all that is required. For a higher gloss finish PHOMI does offer a sealer. **Picture 1.**

Sealing

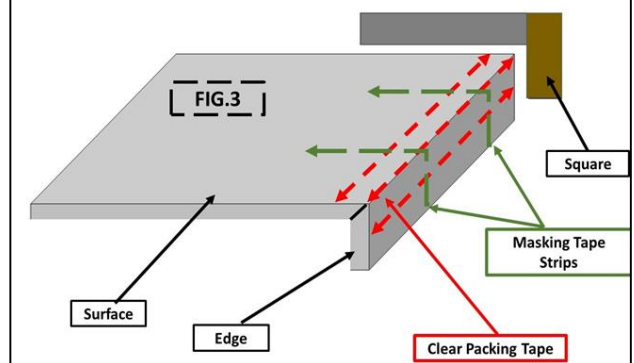
Modified clay is breathable and only requires sealing in kitchen areas, flooring or waterproofing; indoor areas that may be subject to heavy oils, similar materials or showers. There are many sealers available, always test prior to using. We only endorse DRY TREAT; it is the only sealer that won't inhibit MCM's high function properties

CUTTING - TIP: When cutting the surface and edge miters (45°) the slab and cut surface must be flat to avoid cutting a slight curvature in the parts. This will prevent your surface and edge miter from closing tightly. Check your cutting surface and slab material with a straight edge prior to cutting. **FIG. 1**

It is also recommended to make the actual cut 46° - 47° to allow more space for the glue between the miters. **FIG.2**



TAPING - TIP: When attaching an edge the best way to ensure a tight seam between the surface and the edge is by using tape to connect the two pieces. After dry fitting the edges use strips of **masking tape or a similar tape like G-Tape (available through Gran Quartz)** to attach the edge to the surface. Attach the masking tape to the edge first, then pull up and tight and attach to the surface. Place strips 6"-8" apart along the length of the edge. After attaching vertical strips run a full strip of **clear packing tape or clear vinyl tape** along the horizontal surface where the two miters come together. This strip will help hold the edge and surface tight and prevent glue from squeezing out. Pull all tape as tight as possible, to ensure a seamless finish. While gluing check edge with a square to ensure square edges. Remove tape after glue sets, prior to polishing. **FIG. 3**



Picture 1.



Picture 2.



Picture 3.



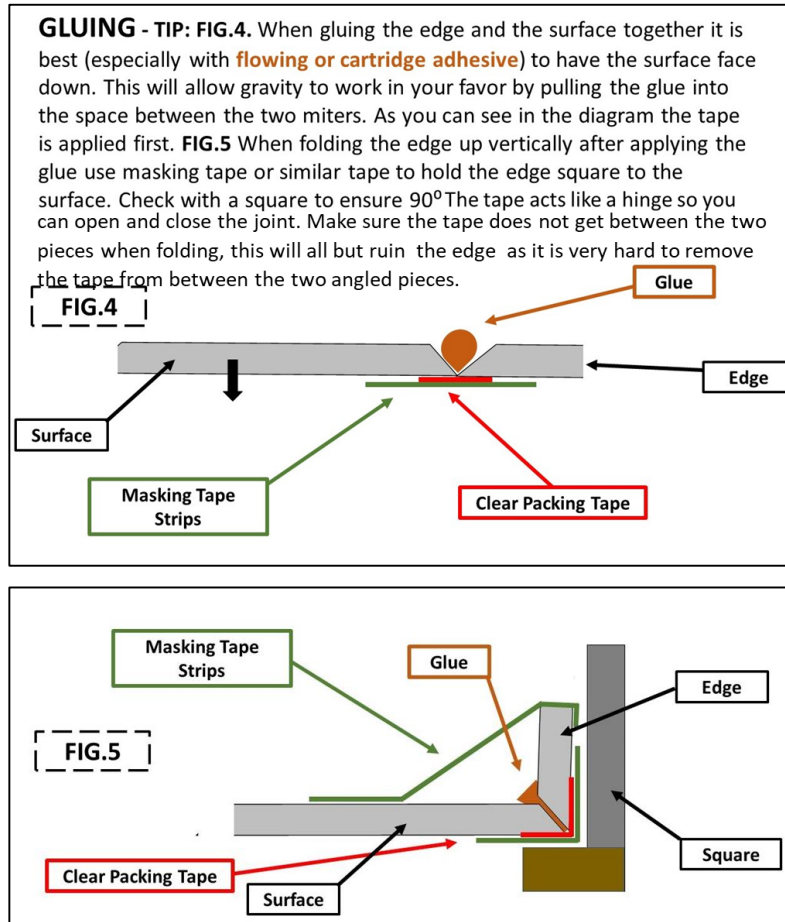
Picture 4.



Fabrication Continued

MCM is highly impact resistant when properly installed. When the manufacturer applies the protective coating used for flooring it becomes highly scratch resistant. For indoor or outdoor cladding or light duty flooring this is not necessary. Uncoated MCM is scratch resistant but if scratched or marred can be repaired. The thru-body color helps conceal any mark. To repair a deep scratch or gouge use one of the recommended fabrication adhesives. See Fabrication Adhesives. Cartridge glue may be a close enough match or a colorant kit and polyester or epoxy resin can be used. Grinding MCM to a fine dust then mixing with a resin may offer the best match. Prior to filling the scratch apply tape to the surrounding material as close as possible to the outline. This will prevent glue from getting on the surface outside of the intended fill area. Screed the color adhesive into the hole and allow to dry. Lightly sand the area using 320 grit or higher to remove any high spots, but do not sand the surrounding finished material. Remove the tape. It is highly recommended to test on scrap material prior to working with finished material.

Repairs



Fabrication Adhesives

Knife Grade Polyester

More than adequate for permanently bonding edges. It is good for surface seams as a non-sag glue that when mixed properly shouldn't shrink or crack. It is stable in indoor applications and can be used for repairs by mixing colorant or grinding material to a powder and applying as a colorant. Protect finished material from exposure to glue except in its intended place, will be difficult to remove.

Flowing Polyester

Difficult to use for miter edges unless in the horizontal position with unfinished side up. It works for horizontal surface seams and when mixed properly shouldn't shrink or crack. It is stable in indoor applications and can be used for repairs by mixing colorant or grinding material to a powder and applying as a colorant. Protect finished material from exposure to glue except in its intended place, will be difficult to remove.

Two Part Cartridge Glue

This is an excellent, easy to use adhesive that requires no mixing. Sold by Gran Quartz - Integra™, Ultima™ and Tenax. This adhesive is a high strength, pre-colored glue and is delivered through a mixing tip. It is perceived to be more expensive but offers excellent consistency and time savings. The cartridge requires a special applicator and tips. Due to its fluid nature (like flowing) the edge must be applied top side down so the glue can flow into the miter cuts. This glue is not ideal for surface seams as it tends to sink between the two pieces. Can be used for repairs matching the correct color. Protect finished material from exposure to glue except in its intended place, will be difficult to remove.

Knife Grade or Flowing Epoxy

Epoxy in general is more expensive but offers a stronger bond and is more stable for outside environments. It is good for surface seams as a knife-grade that when mixed properly shouldn't shrink or crack. It can be used for repairs by mixing colorant or grinding material to a powder and applying as a colorant. Protect finished material from exposure to glue except in its intended place, will be difficult to remove.

Fabrication Thermoforming / Bending

Thermoforming: Thermoforming is the process of heating and shaping synthetic material. It is an increasingly popular way to utilize Modified Clay to create 3-D curves, rounded shapes and radius edges. This is an innovation where other materials such as porcelain, quartz and granite slabs cannot be used. The ability to thermoform has made Modified Clay material a favorite three dimensional artistic pallet for designers, architects and fabricators everywhere.

Pay attention to the following factors when shaping the material into a radius, arc or cylindrical shape.

Material Preparation: cut the material slightly larger than the final dimension as the arc or radius can be difficult to calculate and may be longer than you calculated; this way it can then be trimmed to fit. If mitering pieces together, make the miter cuts as needed prior to heating. A simple calculation of the ARC or radius length can be found on the internet. $ARC\ Length = 2\pi(r)(\theta/360^\circ)$

Heating the Material: it is best to heat the entire piece of material whenever possible. If you are going to gradually heat the material as you form it make sure to support the remaining material and try to keep the heat even as you go along; this will help to avoid any breakage. The material needs to be heated to within a particular range of temperature $200^\circ - 400^\circ$, be careful not to overheat or under heat. Overheating could cause damage and under heating can result in cracking or breaking. There are several methods to heat; heating elements, silicone heat blanket, heat guns, propane heaters or handheld propane torches, even direct sun light outdoors.

Shaping without or using little heat: You can also shape the material by grinding off (removing) the white limestone backing. You can order slabs without the limestone, but there will be an additional charge.

Bending and Shaping: After the material has reached the intended temperature, remove it from the heat and slowly bend it over or shape it into the desired form. If it is bent too rapidly, it may crack or break. If bent too slowly it may cool too soon; generally there is sufficient time to get the heated material to the final shape. When handling the material make sure there are a sufficient number of hands to move, support and shape the material. When forming a radius or arc you may fasten the material at one end using clamps or tape and gradually bend around the form.

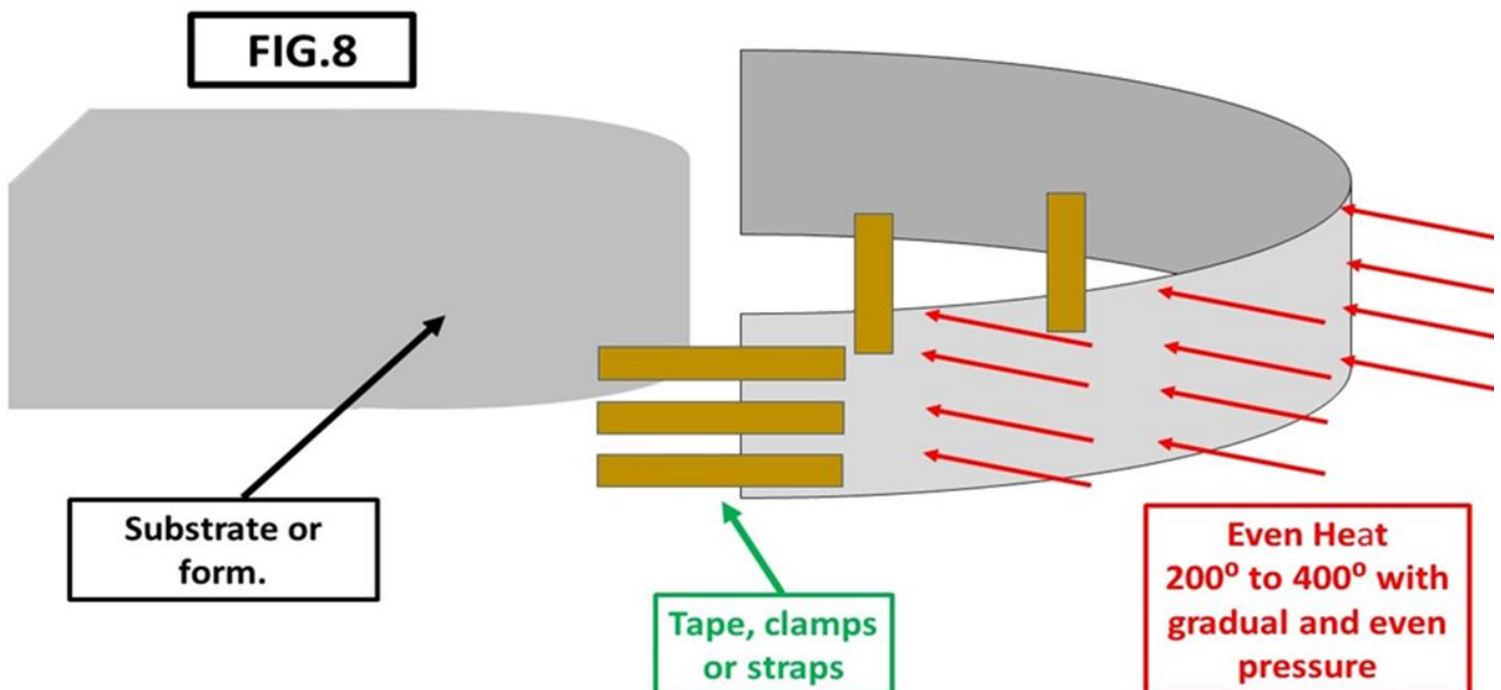
Forms and Molds: you can make a set of male or female molds from plywood or MDF for the material to be placed around for forming. Let the material cool to below 170 degrees before removing from mold. You may also use the final structure, i.e. feature wall, counter top substrate, etc., to form. Alternately you may heat, bend and form as you go. Again, use tape or clamps to hold the material in place as you bend it.

Cool Down: keep the material fixed in place until it reaches $170^\circ F$ at the surface and then remove the restraints to allow the material to release stress. The material will generally hold its shape after cooling.

Final Touches: Attend to seaming and other modifications after thermoforming is complete.

Gluing: It is best to glue the piece after it is formed. If you are doing a large piece such as a feature wall and you need to glue as you go; it is best to use epoxy as it can tolerate higher temperatures. Make sure the material is properly braced as you go long and be careful as even epoxy will cure faster when heated.

Learning: Thermoforming takes practice. Once you have the process down it is not that difficult to do, but be sure to test the process prior to actually The smaller the agglomerate, the smaller the radius you can make. Origina with glass will not bend as tight as Origina without. In general 24" is the tightest radius. An inside radius can be as tight as 6" or less.



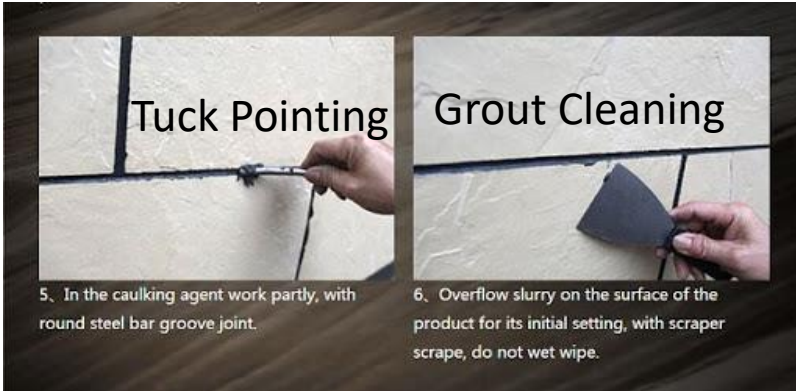
Suitable Substrates

Wet Areas Cementitious boards Durock® /Schluter®-KERDI /WEDI® Board Green Board	All acceptable. Absorbent materials must be waterproofed prior to installation.
Dry Areas Dry Wall MDF / Partial Board / OSB / Plywood Sanded Plywood / Hard Woods	All acceptable. For high humidity or moisture areas absorbent materials must be waterproofed prior to installation.
Structural MDF / Partial Board OSB / Plywood Sanded Plywood Sanded Maple Plywood / Hard Woods Concrete / Block / Brick	All acceptable. For high humidity or moisture areas absorbent materials must be waterproofed prior to installation.
Core Materials Honeycomb – Aluminum/ Thermoplastics PEI - Polyetherimide PET - Polyethylene Terephthalate PVC - Polyvinyl chloride SAN Foam -Styrene acrylonitrile Urethane Foam	These materials are specialized composite structural substrates. Refer to manufacturers for applications and adhesives. Often these materials are only used in special circumstances. If you need light weight structural materials contact: Composites One, they can provide information for structural integrity, technical applications, testing and bonding requirements. For high humidity or moisture areas absorbent materials must be waterproofed prior to installation.
Resurface / Overlay Tile Laminate / Solid Surface Painted or finished Dry Wall Stone – Granite, Marble / Quartz	All acceptable. For non-waterproof materials in wet or high humidity or moisture areas, absorbent materials must be waterproofed prior to installation.

Installation

Overlay No Demo	MCM can be installed over almost any surface, please refer to Suitable Substrates. There is not much difference between new construction and overlay. The most important requirement is to ensure the substrate material is flat, well bonded (no loose tiles) and you use the correct adhesive.
Seams Grout Joints	When surface seaming MCM it is best to use a knife grade adhesive to help ensure there is no lippage; a flat substrate, an even layer of adhesive and flat material is critical. It is advisable to use tape to hold the material flat at the seam or to hold pieces in place. MCM is non-rectified but easy to trim for butted joints. When using grout use suitable grout for the application based on grout manufacturers recommendations. Allow the grout to set, but not fully cure and remove excess with a plastic scraper. Using a wet sponge is not recommended as it can be more difficult. Joints and seams can also be filled with color matched or contrasting silicone or caulk. It is advisable to limit the fill material to the joint only. Reusable tape can help protect surrounding material and shorten clean up time.
Flooring	Refer to Adhesive Manufacturers Specification Guide It is recommended by the Manufacturer to apply a sealer or order material with manufacturers sealer applied. Material should be bedded and buttered.
Dry walls	Any walls that are absorbent in nature, i.e. gypsum board, MDF, particle board should be waterproofed using Red Guard® or similar.
Outdoor Cladding	Refer to Adhesive Manufacturers Specification Guide
Hardscape	Refer to Adhesive Manufacturers Specification Guide

Installation Images



Utilizing Tape to hold material tight for Overlay



Care and Maintenance

Indoor Care

MCM requires no special cleaning, low PH cleaners or mild soap and warm water.

Outdoor Care

MCM is a self-cleaning product. Rainfall will normally keep MCM clean. If you live in a drier climate you can occasionally use a hose to rinse the material. If dirt gathers near the base, use mild soap and water.

Sealers



In areas where there is high oil exposure such as back splashes behind cooking equipment, commercial kitchens, a sealer will make cleaning easier. We recommend Dry Treat®. Dry Treat will not interfere with the Human Centric Benefits such as breathability. Only apply a light mist coating. For MC colors that have more texture or depth a second coat in the opposite direction is recommended to ensure complete coverage. This sealer is high VOC therefore we recommend drying 1-2 days prior to installation to allow VOC's to dissipate. Other sealers are available always test in an inconspicuous spot.

Flooring

MCM Flooring has a coating applied at the factory, to protect it from heavy traffic and scratches. The coating can also be applied at anytime.

General

In general MCM is very durable and needs little to no maintenance. It is chemical resistant, Class A Fire Rated and has been 70-year lifecycle tested. For any questions or further information please contact: Modern Materials

This manual is published by Modern Materials is to inform fabricators and installers of the recommendations by Modern Materials for fabricating and installing modified clay supplied by Modern Materials or its distributors to fabricators and installers. This guide does not replace normal industry standards for the fabrication, installation and craftsmanship of similar materials or applications. A basic knowledge of stone, tile and slab materials fabrication and installation is required. This guide is not a substitute for any state building codes, contractor's guidelines or laws or manufacturers recommendations or specifications for ancillary products such as, but not limited to adhesives, caulks sealers, etc. Modern Materials recommendations for ancillary products does not imply any warranty. Warranties for those products are supplied by those manufacturers. Modern Materials and/or its assigns are not responsible for errors or omissions, or for damages resulting from the use of information contained in this document. In no event shall the publisher and the author be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly as a result of any person relying upon any information contained in this document. All work carried out by any user of this manual on any Modified Clay Material must be done in accordance with all laws and regulations relating to that work and the slab, including but not limited to, occupational health and safety laws and laws relating to the protection of the environment.

PROPOSITION 65 WARNING: Quartz surfaces, including Caesarstone, contain crystalline silica, a material known to the State of California to cause cancer.

Modern Materials Warranty for UPHO, PHOMI, ESOD MCM Products

MODERN MATERIALS Warranty:

Modern Materials, LLC warrants that our products meet or exceed the Technical Characteristics and Product Specifications as listed in the current PHOMI, UPHO, ESOD Technical Manual. We also warrant our Modified Clay Material to comply with any representations made in our product literature and to be reasonably free from manufacturing defects. Shade variation is not a manufacturing defect. Warranty only applies to products that have been paid for in full.

Residential 10 Year Limited Warranty:

Modern Materials, LLC warrants to the original purchaser that it will provide replacement material or refund the purchase price at our discretion of any product that fails to meet the requirements above. Labor costs for removal of existing product and installation of replacement product is not included. Shade match of the replacement product to that being replaced cannot be guaranteed. This 10-year warranty against manufacturing defects on Modern Materials products purchased is in effect for as long as you own your home and is non-transferable.

Commercial Warranty:

Modern Materials, LLC defines a commercial installation as any structure apart from a dwelling occupied by the owner of the product. We warrant that we will provide replacement material or refund the purchase price at our discretion of any product that fails to meet the requirements above for a period of 18 months from the date of shipment of the product. Labor cost for removal of existing product and installation of replacement product is not included. Shade match of the replacement product to that being replaced cannot be guaranteed.

Warranty Limitations:

Modern Materials LLC or the Manufacturer makes no other warranties, express or implied, including merchantability or fitness for a particular purpose. Purchaser's remedy is limited to replacement as described above, and under no circumstances shall the manufacturer be liable for any loss or damage arising from the purchase, use, or inability to use this product, or for any special, indirect, incidental, or consequential damages. Product failure due to improper installation, intentional or unintentional misuse or abuse or failure to follow the Care Guide will void this warranty. No installer, dealer, agent, or employee of Manufacturer has the authority to modify the obligations or limitations of this warranty.

These warranties give specific legal rights. Since some states have laws governing consumer rights and damages, some of the above limitations may not apply to you, and you may have other rights which vary from state to state. Except for these other rights, the remedy provided under these warranties state the limit of the Manufacturer's responsibilities.

To file a warranty claim:

Send pictures, original receipt, installer information, date of installation and explanation of claim to:

6671 Las Vegas Blvd S, Bldg. D Suite 210

Las Vegas, NV 89119

Attn: Warranty Dept.

Or Email to: