

HI-MACS® FABRICATION GUIDE



HI-MACS®

THE NEW GENERATION OF INSPIRATION

HI-MACS Fabrication Guidelines

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1. SELLING POINT & ADVANTAGES OF HI-MACS®

1.1. What are the key selling points of HI-MACS®?

What is HI-MACS®?

HI-MACS® is an acrylic solid surface countertop product. Acrylic is a more durable material when compared to polyester, which can be brittle and may damage easily. The product is manufactured using state-of-the-art technology and produced in sheets.

HI-MACS® is non-porous

Your countertops are safe for food preparation and carry full NSF (National Sanitation Foundation) certification. When a material or seam is porous, food particles can be trapped in the material, becoming a breeding ground for bacteria and contamination.

HI-MACS® appears seamless (inconspicuous seams)

Because there are no grout lines, your countertop looks like continuous material — making it ideal for both beauty and cleanliness.

HI-MACS® is renewable

No matter the nick, scratch or stain, HI-MACS® can be restored to its original state by a certified professional.

HI-MACS® is the optimal design

½ inch thicknesses are ideal for countertops, shelving, surrounds and other horizontal applications.

HI-MACS® is affordable luxury

- HI-MACS® brings elegance into your home, not only allowing you to step up from lower cost materials but also bringing a beautiful finish to more parts of your home.
- Due to the most modern equipment and manufacturing processes in the industry, solid surface is a better value than similar products.
- The superior quality of HI-MACS® results in extremely low warranty claims and minimal call backs. HI-MACS® is backed by a fully transferable 15-year warranty
- This outstanding warranty will give your customers even more confidence in their purchase.
- Fully transferable, meaning their investment becomes an excellent selling feature of their home. HI-MACS® is manufactured in a state-of-the-art facility located in Georgia, USA
- Our preferred kitchen and bath dealers have many collections and patterns available for you to choose from.
- All colors are available for both horizontal and vertical applications, which means you can choose any color that is right for your design with confidence. Your style can then extend beyond the countertop into backsplashes, secondary counters adjacent to the kitchen, built-in desks - you name it. Installed by certified fabricators
- All fabricators are certified to fabricate and install HI-MACS®. This means they are proven professionals which is reflective of the quality and service expectations of LG Hausys.

1.2. HI-MACS® Advanges

See For Yourself Why You Should Choose HI-MACS®

	HI-MACS®	Other Solid Surface	Plastic Laminate	Granite	Synthetic Stone	Tile
WARRANTY HI-MACS® offers a 15-year fully transferable warranty.	15 yr.	10 yr.	–	–	10 yr.	–
VALUE Because of the affordability of HI-MACS®, you can stretch your design dollars in other areas.	\$\$	\$\$\$	\$	\$\$\$\$	\$\$\$	\$\$\$
VERSATILITY HI-MACS® combines beautifully with stainless steel, wood, chrome, brass, glass and more. All colors are available in ½ inch thickness for use in horizontal and vertical applications.						
STAIN RESISTANCE Thanks to its unique technology, HI-MACS® withstands most everyday stains.						
RENEWABLE No matter what the scratch, nick or stain, HI-MACS® can be restored to its original state by a certified professional.						
NON-POROUS/EASY TO CLEAN HI-MACS® is easy to clean. It is non-porous and as a result, it will not promote the growth of mold, mildew or bacteria, making it ideal for kitchens and baths.						

2. PRODUCT SPECIFICATION

2.1. HI-MACS® Product Families

1) Classic

Soft or loud, subtle or staggering, HI-MACS® CLASSIC's shades and particulate patterns will let your space speak in exciting and original ways.



2) Classic - Never Compromise Collection

Soft or loud, subtle or staggering, HI-MACS® CLASSIC's shades and particulate patterns will let your space speak in exciting and original ways.



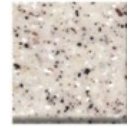
Tapioca Pearl
G50



White Quartz
G04



Sea Oat Quartz
G38



White Granite
G05



Vanilla Sugar
GT913



Moonscape Quartz
G58



Almond Pearl
G08



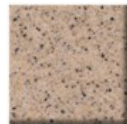
Annato Granite
G606



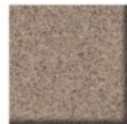
Harvest
GT908



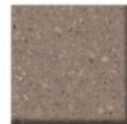
Desert Sand
G01



Aztec Quartz
G33



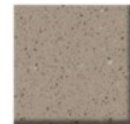
Venetian Sand
G42



Trail Gray
GT912



Platinum Granite
G07



Storm Granite
G602



Oregano Sand
G62



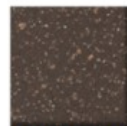
Armadillo
GT909



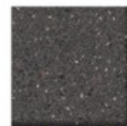
Allspice Quartz
G63



Spiced Java Sand
G59



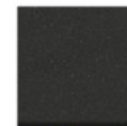
Mocha Granite
G74



Graphite Granite
G103



Midnight Pearl
G15



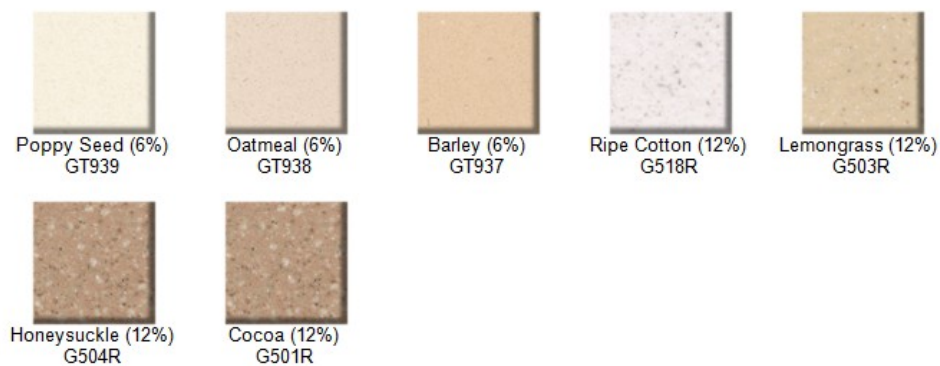
Black Pearl
G10

3) Classic - Designer Solid Collection



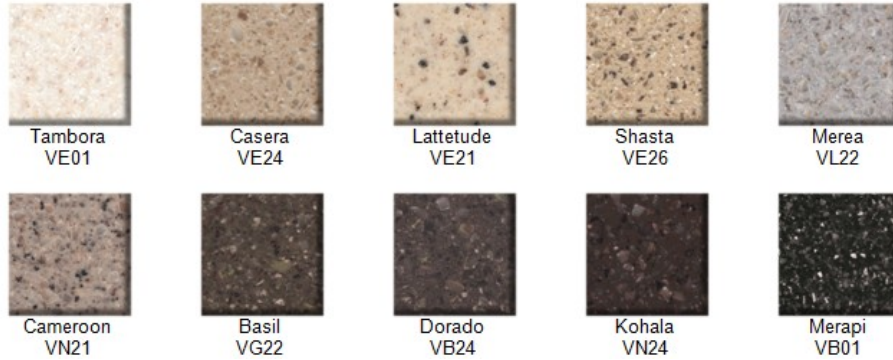
4) Eden Plus - Recycled Content

Explore sustainable design with HI-MACS® Eden Plus Surfaces. Our HI-MACS® Eden Plus Surfaces are environmentally conscious, featuring certified pre-consumer recycled material. HI-MACS® Eden Plus Surfaces are GREENGUARD certified for indoor air quality and can receive LEED credits in sustainable design.



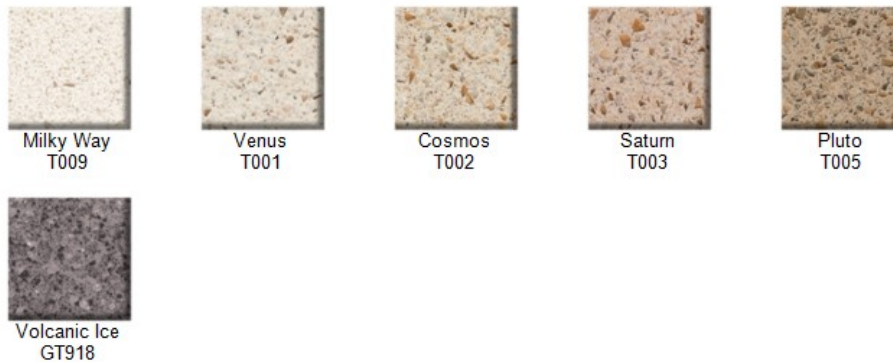
5) Volcanics

Large translucent chips in HI-MACS® Volcanics Solid Surface create dazzling color options, giving your surface breathtaking beauty, clarity and depth.



6) Galaxy

Introducing HI-MACS® Galaxy the next dimension in solid surface. Out of this world colors are fused with large transparent chips to emphasize today's new quartz styles while maintaining all of the features and functionality of solid surface.



7) Marmo

Introducing HI-MACS® Marmo, a contemporary solid surface that embodies the organic look of natural stone. A captivating combination of veined patterns and translucent chips, solid surface has never looked so natural.



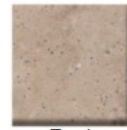
Genova
M209



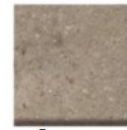
Firenze
M103



Lucca
M203



Terni
M201



Canossa
M202



Bergamo
M204



Pisa
M207



Parma
M205



Monza
M206

2.2. Product Size

HI-MACS sheets are an acrylic based product, either 100% acrylic or acrylic with a proprietary blended specialty chip (such as the Galaxy and Volcanics product line). All sheets are manufactured using strict quality assurances to ensure that the customer receives the highest possible quality product.

Volcanics, Eden Plus, Marmo, and Galaxy series are not produced in ¼" (6mm).

Sheet thickness	Sheet width(mm)	Sheet length(mm)	
¼" 6mm	30" 760mm	98" 2490mm	
½" 12mm	30" 760mm		145" 3680mm
Thickness	Size(mm)	Weight(kg)	
		Solid	Granite
½"	30" x 145"	134 lbs	126 lbs

Distinguish Lot Numbers

HI-MACS G-05 WHITE GRANITE 1 4 J 8

Pttn Mark Name Mark

1 4 J 8

Line No Year Month Day

LG HAUSYS HI-MACS MADE IN KOREA NSF-S1 881276388-0004

LG HAUSYS HI-MACS MADE IN KOREA NSF-S1 881276388-0004

LG HAUSYS HI-MACS MADE IN KOREA NSF-S1 881276388-0004

HI-MACS 17E

Line No / Year / Month

Month	Mark	Day	Mark	Day	Mark
1	A	1	1	17	H
2	B	2	2	18	J
3	C	3	3	19	K
4	D	4	4	20	L
5	E	5	5	21	M
6	F	6	6	22	N
7	G	7	7	23	O
8	H	8	8	24	P
9	I	9	9	25	Q
10	J	10	A	26	R
11	K	11	B	27	S
12	L	12	C	28	T
		13	D	29	U
		14	E	30	V
		15	F	31	W
		16	G		

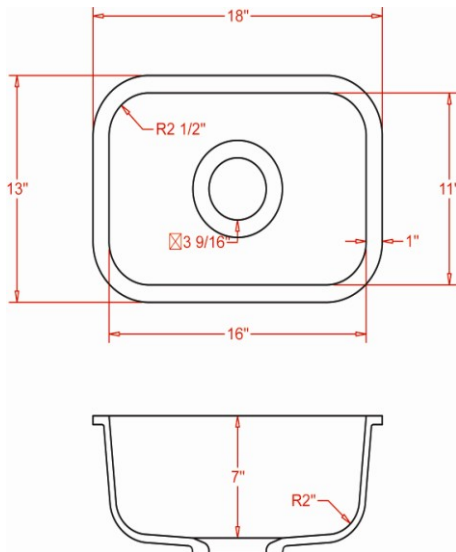
※ For day mark, "I" is dropped.

2.3. Shaped Materials

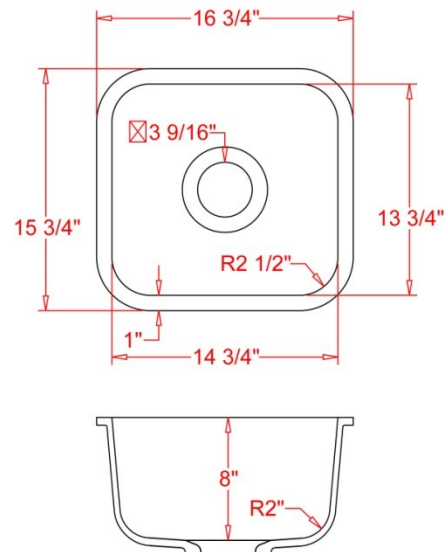
LG Hausys offers a complete line of vanity and kitchen sinks. These models are all easily sealed to the HI-MACS countertop you are creating and will provide a beautiful smooth, clean and well designed countertop or vanity.

1) Acrylic Sinks

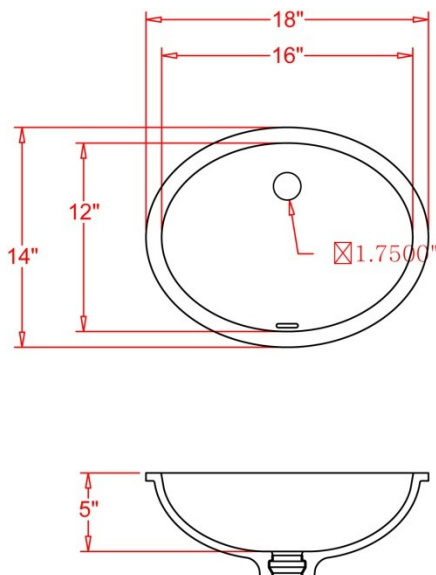
Single Bowl Kitchen Sink 1318



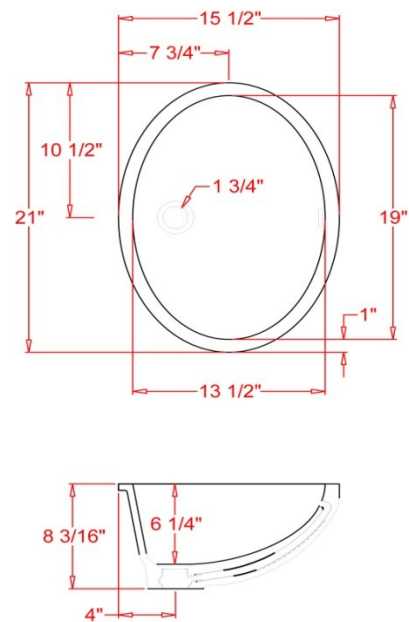
Single Bowl Kitchen Sink 1517



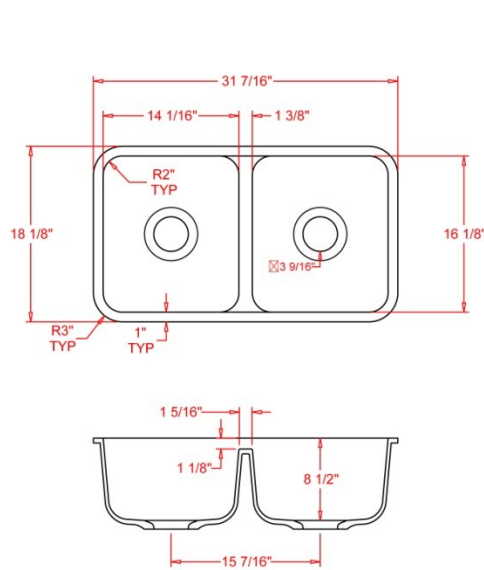
Oval Sink 1612



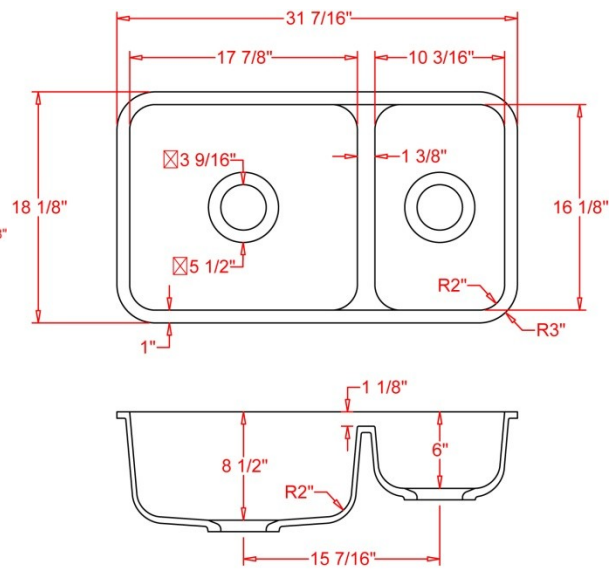
Oval Sink 1914



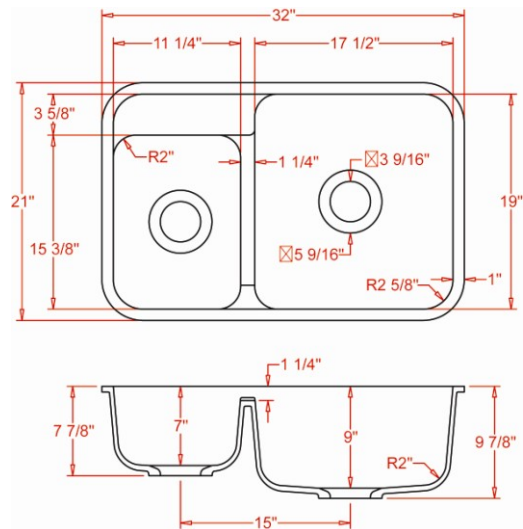
Double Bowl Kitchen Sink 3118



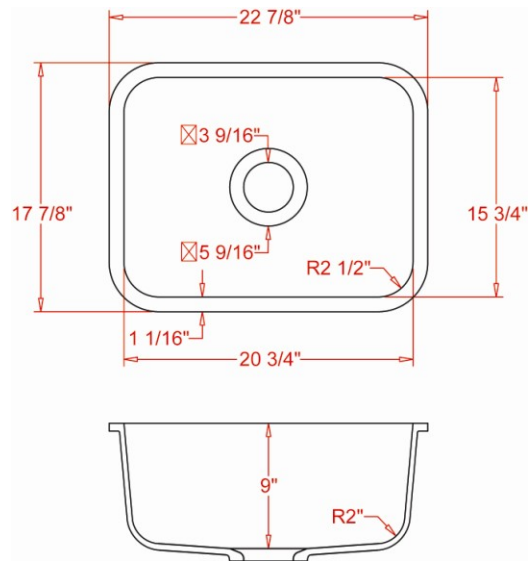
Double Bowl Kitchen Sink 3218



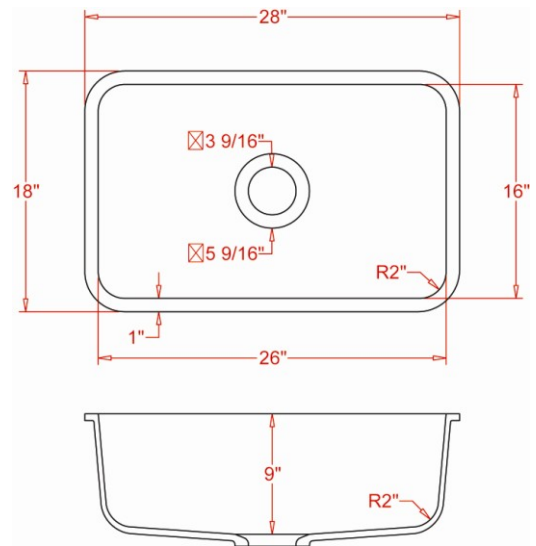
Double Bowl Kitchen Sink 3221



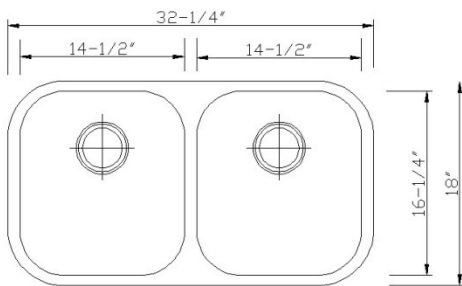
Single Bowl Kitchen Sink 2318



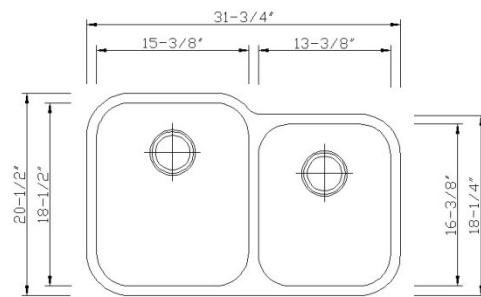
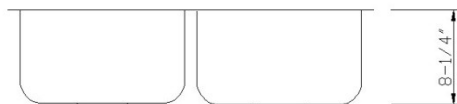
Single Bowl Kitchen Sink 2818



2) Lovello® Stainless Steel Sinks

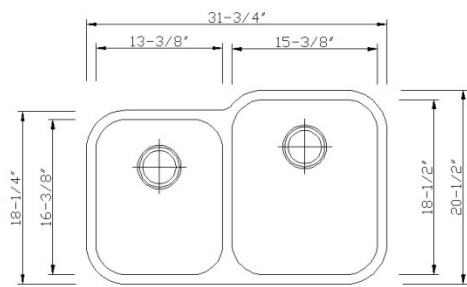


SS55-3318

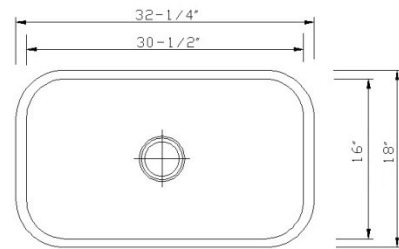
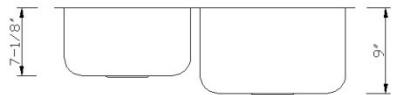


SS64-3221L

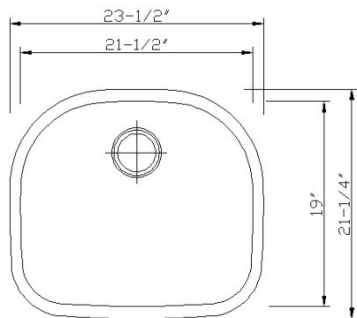




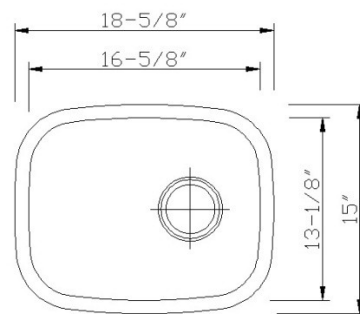
SS64-3221R



SS1-3219

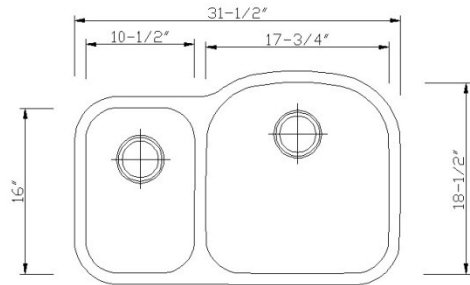


SS1-2422

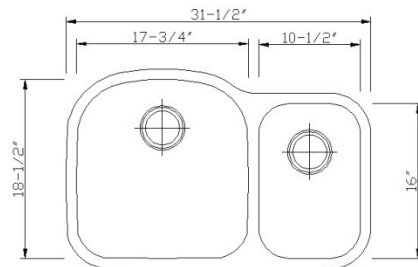
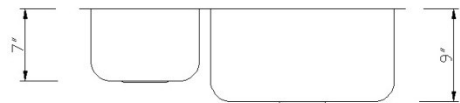


SS-1915

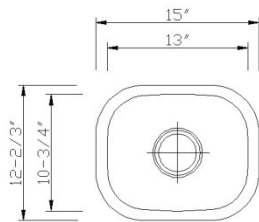
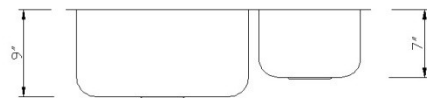




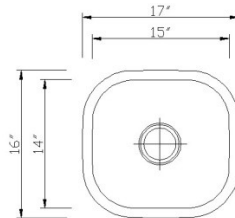
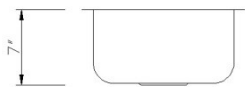
SS73-3219R



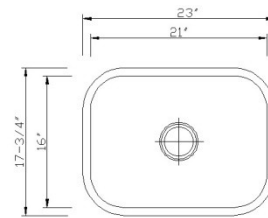
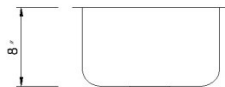
SS73-3219L



SS-1513



SS-1716



SS1-2318



2.4. Adhesive

Be sure to use an adhesive color selection chart to review the properly coded adhesive for the HI-MACS® sheet color selected. It is important to comply with the recommendations set forth. This will ensure proper color match of the finished seam.

- Bulk adhesive cartridges typically provide 1000mm of seaming.
- Normal cure time is about 40 minutes in 21 degrees C. If hotter, your working time is greatly reduced and, if cooler, your working time is extended. Consider this as you begin assembly. You do not want to get too far ahead of yourself if it is warm.
- Remember to consider scuff-sanding joints for better bonding using 60 grit sandpaper.
- Before applying the adhesive, clean all areas being bonded with denatured alcohol and a clean white rag. Inspect for dirt, pencil marks, and oily fingerprints on all bonding surfaces and remove them.
- Assemble the cartridge in the seaming gun with a fresh disposable mixing tip. After each use, remove and replace this tip. The adhesive in the tip will set up just as the seams do on your materials. If you are finished gluing for the day, you can leave the tip on and place it in the storage refrigerator. The next time you use it you only need to change the tip.
- As you get ready to apply adhesive and begin assembly of your HI-MACS® top, remember to purge the tip. This is done by squeezing out a bead of approximately the length of the tip. This ensures trapped air has worked itself from the mixing tip and that the catalyst and adhesive have properly mixed and are ready



2.5. Adhesive Color List

SOLID			
HI-MACS		ADHESIVE	
NO	COLOR	NO	COLOR
S02	ALMOND	H04	PEANUT
S06	ARCTIC WHITE	T03	CLEAR WHITE
S09	CREAM(VANILLA)	H20	CREAM
S29	IVORY WHITE	H32	IVORY
S28	ALPINE WHITE	H16	ALPINE WHITE
ST903	HAZELNUT	H70	FLESH
S103	Concrete Grey	H53	Concrete Grey
S207	Marta Grey	H92	MARTA GREY
S215	Mazarin Blue	H102	MAZARIN BLUE
S205	Florida Orange	H108	FLORIDA ORANGE
S209	Steel Grey	H101	SMOKE GREY
S208	Festival Pink	H106	FESTIVAL PINK
S216	Lilac Haze	H103	LILAC HAZE

SAND & PEARLS / QUARTZ & GRANITE			
HI-MACS		ADHESIVE	
NO	COLOR	NO	COLOR
G01	DESERT SAND	H04	PEANUT
G02	GRAY SAND	H03	GRAY
G04	WHITE QUARTZ	H36	SILVER
G05	WHITE GRANITE	H03	GRAY
G06	ROSE QUARTZ	H05	APRICOT
G07	PLATINUM GRANITE	H03	GRAY
G08	ALMOND PEARL	H04	PEANUT
G09	BLACK SAND	H42	MERAPI
G10	BLACK PEARL	H07	BLACK
G15	MIDNIGHT PEARL	H10	BLUE
G17	GRAY GRANITE	H03	GRAY

VOLCANICS			
VB-01	MERAPI	H42	MERAPI
VE-01	TAMBORA	H20	CREAM
VE-11	AMBERGLOW	H04	PEANUT
VG-11	VETRO	H71	GREEN HAZE
VW-11	POWDER	H36	SILVER
VY-11	ZAFFRE	H72	DOVE GRAY
VE-12	MOONMIST	H01	SATIN WHITE
VE-13	KAFFA	H73	MILKY PINK

VOLCANICS (NATURAL)			
VE21	LATTITUDE	H04	PEANUT
VL21	SANTORINI	H10	BLUE
VN21	CAMEROON	H64	CLASSIC ROSE
VN22	DOMINICA	H46	HEKLA
VN24	KOHALA	H50	KOHALA
VR21	STELLER	H47	STELLER
VE-24	CASERA	H04	PEANUT
VG-22	BASIL	H13	O/YELLOW
VL-22	MEREA	H21	P/WHITE
VN-23	CASTLE	H22	P/GREY
VW-21	FRESH	H02	A/WHITE
VG-23	MARIN	H03	GREY
VB24	DORADO	H74	DORADO
VE26	SHASTA	H75	SHASTA

*** Clear color is available to order (H00-Clear)

SAND & PEARLS / QUARTZ & GRANITE			
HI-MACS		ADHESIVE	
NO	COLOR	NO	COLOR
G18	ROSE GRANITE	H05	APRICOT
G22	BEIGE SAND	H03	GRAY
G23	NATURAL GRANITE	H03	GRAY
G24	AQUA GRANITE	H08	GREEN
G26	APPLE GREEN SAND	H11	SAGE GREEN
G29	TERRA QUARTZ	H05	APRICOT
G30	IVORY QUARTZ	H04	PEANUT
G31	BLACK GRANITE	H07	BLACK
G32	STEEL SAND	H03	GRAY
G33	AZTEC QUARTZ	H04	PEANUT
G34	ARCTIC GRANITE	H36	SILVER
G38	SEA OAT QUARTZ	H04	PEANUT
G39	AZURE QUARTZ	H03	GRAY
G40	CELEBRATION GRANITE	H07	BLACK
G42	VENETIAN SAND	H26	SAND BROWN
G43	VERDE QUARTZ	H08	GREEN
G44	SEA FOAM QUARTZ	H11	SAGE GREEN
G48	BEACH SAND	H04	PEANUT
G50	TAPIOCA PEARL	H36	SILVER
G58	MOONSCAPE QUARTZ	H04	PEANUT
G59	SPICED JAVA SAND	H14	SEPHIA
G62	OREGANO SAND	H13	OLIVE YELLOW
G63	ALLSPICE QUARTZ	H14	SEPHIA
G64	FOLIAGE QUARTZ	H15	SAND
G65	TUNDRA QUARTZ	H02	A-WHITE
G70	DELTA SAND	H15	SAND
G72	SIENNA QUARTZ	H12	LIGHT BROWN
G73	MESA GRANITE	H14	SEPHIA
G74	MOCHA GRANITE	H37	MOCHA
G75	SONORAN GRANITE	H04	PEANUT
G223	MAUI QUARTZ	H04	PEANUT

G102	CRYSTAL GRANITE	H61	OYSTER
G103	GRAPHITE GRANITE	H62	STEEL GRAY
G122	Bamboo Leaf	H39	LATTE
G124	Birchwood	H01	S/White
G117	Cappuccino	H03	GREY
G118	Moon Haze	H32	IVORY
G125	Coswal	H88	LEATHER BEIGE
G123	Cotton Dust	T03	CLEAR WHITE
G111	Macchiato	H36	SILVER
G121	Mapple Meadow	H80	BEIGE
G601	EUCALYPTUS GRANITE	H65	OLIVE DRAB
G602	STORM GRANITE	H66	SKY GRAY
G603	SADDLE GRANITE	H67	GAMET
G604	TIMBERWOLF GRANITE	H68	TERRA COTTA
G605	UMBER GRANITE	H69	CHESTNUT BROWN
G606	ANNATO GRANITE	H70	FLESH
GT907	STONEWALL	H26	SANDED BROWN
GT908	HARVEST	H70	FLESH
GT909	ARMADILLO	H79	DARK BRONZE
GT910	EGG WHITE	H36	SILVER
GT911	CORK	H75	SHASTA
GT912	TRAIL GREY	H68	TERRA COTTA
GT913	VANILLA SUGAR	H04	PEANUT
GT914	MERINO	H36	SILVER
GT915	METEOR	H42	MERAPI
GT918	VOLCANIC ICE	H62	STEEL GRAY
GT921	CHAMOIS	H91	PALE APRICOT
GT923	SNOWBIRD	H36	SILVER
GT924	PEPPER BLANCO	H36	SILVER
GT925	STARRY NIGHT	H42	MERAPI
GT927	Cayenne	H93	CAYENNE
GT933	Bellany	H04	PEANUT
GT934	Hazelnut Shell	H88	LEATHER BEIGE

EDEN PLUS			
HI-MACS		ADHESIVE	
#	COLOR	#	COLOR
G501R	COCOA	H67	GAMET
G502R	IVY GRANITE	H13	OLIVE YELLOW
G503R	LEMONGRASS	H04	PEANUT
G504R	HONEY SUCKLE	H46	HEKLA
G511R	POPLAR	H04	PEANUT
G515R	PECAN	H80	BEIGE
G512R	HORSE CHESTNUT	H86	CHOCOLATE
G517R	MOUNTAIN ASH	H04	PEANUT
G510R	SUGAR MAPLE	H75	SHASTA
G516R	HICKORY	H04	PEANUT
G514R	BIRCH BARK	H01	S/WHITE
G513R	WALNUT	H69	CHESTNUT BRN
G518R	RIPE COTTON	H85	LIGHT GRAY
G519R	PURE SNOW	H36	SILVER
G520R	PURE FROST	H36	SILVER
GT937	Barley	H70	FLESH
GT938	Oat Meal	H88	LEATHER BEIGE
GT939	Poppy Seed	H01	S/WHITE

SPECTRUM			
S04	APRICOT	H05	APRICOT
S05	GREY	H03	GREY
S22	BLACK	H45	V/BLACK
S25	FIERY RED	H18	RED
S26	BANANA	H17	BANANA
S27	ORANGE	H19	ORANGE
S100	COFFEE BROWN	H37	MOCHA
S101	JASMINE GREEN	H51	JASMINE GREEN
G107	PEBBLE PEARL	H03	GREY
G108	LUNAR SAND	H36	SILVER
S204	VENUS GREEN	H11	SAGE GREEN
S102	BABYLON BEIGE	H80	BEIGE
S104	TOFFEE BROWN	H81	BROWN OLIVE
S203	SKY BLUE	H82	SKY

LUCENT			
S302	OPAL	T02	OPAL
S303	SAPPHIRE	H76	FOG
S304	RUBY	H77	PEACH BLOSSOM
S305	EMERALD	H78	SEA GRASS

GALAXY			
T01	Venus	H32	IVORY
T02	Cosmos	H04	PEANUT
T03	Saturn	H04	PEANUT
T04	Mercury	H75	SHASTA
T05	Pluto	H75	SHASTA
T06	Phobos	H03	GRAY
T07	Jupiter	H87	COCOA WHIP
T08	Blackhole	H53	C/GRAY
T09	Milky Way	H36	SILVER

MARMO			
M103	Firenze	H32	IVORY
M201	Terni	H88	LEATHER BEIGE
M202	Canossa	H15	SAND
M203	Lucca	H06	PINK
M204	Bergamo	H26	SANDED BROWN
M205	Parma	H39	LATTE
M206	Monza	H07	BLACK
M207	Pisa	H26	SAND BROWN
M209	Genova	H36	SILVER

3. SAFETY

3.1. Standard safety practices and procedures

1. Always wear appropriate clothing. Serious injury can occur if safety precautions are not followed in the workplace or on the jobsite.
2. Follow safety instructions and warnings on all MSDS sheets for all products used in the shop.
3. Follow all manufacturers safety guidelines for all tools and equipment used in the shop.
4. Safety boots are recommended. LG HI-MACS sheets are heavy and even heavier when fabricated into a monolithic counter top.
5. Always use eye protection with side shielding. Dust, particles, and routing materials can get into the eye and irritate or damage the eye. Power tools, sanding disks, blades and bits can also be a source of danger to your eyes. Unprotected exposure to such dangers can result in serious injury or blindness.
6. When handling sheets, leather work gloves should be used to protect to your hands. Additionally, the edges of the LG HI- MACS sheets may be sharp and you may cut yourself. Leather work gloves also offer you a better grip on the sheets when moving or carrying them throughout the shop.
7. While working with seaming adhesive or inlay materials, latex or rubber gloves will limit the exposure of the adhesive material to bare skin. Should the skin come in contact with the adhesive or catalyst, thoroughly wash it clean using warm soap and water. If it comes in contact with the eyes, flush eyes immediately with water and seek medical attention.
8. It is recommended to provide hearing protection when working around shop machinery and shop power tools. The decibel level of most machinery and power tools can exceed the safe limits of 85 decibels for an extended period of time, typically 8 hours. If in doubt as to your respective shop noise limits, please have your shop tested. Exceeding these limits can damage your hearing, resulting in hearing loss over time.
9. The dust from cutting and fabricating LG HI-MACS is non-toxic and otherwise referred to as nuisance dust. Regardless, routing, sawing, cutting, and sanding over a long period of time can result in irritation to the eyes, skin, and respiratory system. It is extremely important to establish adequate ventilation and dust collection equipment to prevent the dust levels from exceeding permissible levels of 15mg/m3. Additional precautionary measures will include disposable dust masks and approved NOISH respirators. If the eyes are irritated by the dust, flush them for a period of 15 minutes with cool fresh water.
10. Adhesive items have an element of combustibility. Make certain to keep the work areas well ventilated and do not allow it to be put in contact with heat, sparks or flames.
11. Review your shop and actions being performed in your facility to ensure that you have the necessary protection and that safety requirements are being met or exceeded. The added precautionary dollars spent will far benefit the cost of loss or injury to yourself or an employee.

12. Reference your local OSHA guidelines for additional Local, State and Federal Safety Guidelines.

3.2. Safety guidelines

- Provide and maintain adequate first aid supplies
- Protective dust masks, eye and ear protection provided or required
- Safety boots or shoes required
- Protective work gloves provided or required
- Establish a policy on no jewelry, bracelets or chains while fabricating
- No smoking in work areas
- Policy on limited bare skin exposure to adhesive materials
- M.S.D.S. sheets reviewed and understood by all employees
- Entrance and Exit passage ways are not obstructed and are visibly displayed
- Fire doors are clear from blockage. i.e. Security chains, etc.
- Explosion proof cabinets for solvents and chemicals
- Adequate cold storage for seaming materials (refrigerator)
- Properly specified fire suppression or extinguisher system including sprinklers
- Inspection of fire equipment on a regular basis
- Fire evacuation plan and responsibility assignments
- Maintenance of ventilation and dust extraction equipment including routinely cleaning/replacing filters, keep work tables and floors clean, swept and orderly. Extraction of dust and particles should be placed in a covered receptacle.
- Designate a tool crib for hand tools, bits and supplies to maintain production efficiency
- Remove or contain dust by approved dust collection equipment, accessories, and systems
- Designate a special place for disposal of hazardous chemicals, waste seam adhesive, etc.
- Establish a policy of not disposing liquids, adhesives or chemicals in common trash unless catalyzed. Rags with chemicals should be cared for so as not to create fire hazard.
- Avoid operating equipment with dull blades and bits

- Purchase proper equipment for the job and routine production of LG HI-MACS
- Make certain to eliminate slip factors on the floor surfaces, and thoroughly wipe up spills to eliminate accidental slips and falls
- Install proper electrical service requirements for specified shop equipment
- Install safety mechanisms on power equipment for emergency shut offs
- Clearly mark and identify shop circuits on electrical panel
- Make certain all equipment cords and electrical extension cords are in perfect working order and are free from defects, frays, and bare wiring that could result in a shock or short. Make certain electrical cords are rolled and outlets are clean and operational. Any defect should be serviced and replaced immediately upon notice of deficiency.
- Portable electrical hand tools are double-grounded, ground fault equipped
- Make sure junction boxes and wiring are to code and are covered and closed
- Lighting is adequate for working conditions and maintained
- Always comply with OSHA and all local safety standards.

4. MATERIAL HANDLING

4.1. Receiving, inspection, handling, storage

Sheet Inspection upon Arrival at storage

- Check to ensure the lot numbers are in sequence or within allowable tolerance (+/- 50)
- Check for visual defects on the surface or edges once peel coat is removed. Please note that color may vary slightly from run to run and from the sample itself. Lists of inspection items that should be checked;
- Color difference within same lot.
- Scratches
- Bending
- Pin hole
- Crack
- Thickness difference

Do not cut the materials before visible inspection and matching process is completed in shop.

HANDLING

Safety is the main precursor to fabrication and movement of materials. Remember, LG HI-MACS sheets weigh approximately 4.4 pounds per square foot in half-inch material, and approximately 2.2 pounds per square foot in quarter-inch sheet materials. With that being said, use common sense and do not move these sheets by hand alone.



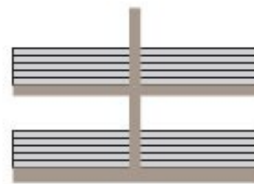
Workers should wear leather work gloves for better grip and ease on wear and tear on the hands and fingers. Two workers should tip the sheet along the width from horizontal to vertical. The sheet should then be transported to the fabrication area vertically with the edge of the long ends of the sheets parallel to the ground

A fork lift is an essential tool for a safe work environment. A forklift is an efficient method and must be used when moving or transporting multiple sheets. It is best suited to have a fork lift that has adequate capacity to move an entire skid of material at once (approximately 2,100 pounds) on half-inch materials. It is further recommended to purchase fork boots comprised of steel that fit over the standard forks. They are approximately 8 feet in length and can pick up the pallet from the end rather than the side

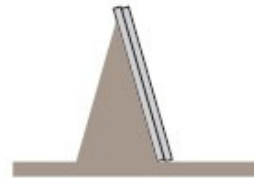
STORAGE

HI-MACS sheets should be stored flat or in approved horizontal racks (See Below). If temporarily stored, place sheeting on a completely flat floor or non- damaged transportation pallet. Vertical storage should be limited to an “A” frame designation to eliminate the possibility of warping.

Correct



Horizontal Storage[○]



Vertical Storage[○]

HI-MACS should be stored indoors. Storage of sheets outdoor is not recommended. If necessary, any outdoor storage of HI-MACS should be limited short durations of time and not under extreme temperatures. The range of temperature should be 59-77 degrees F and not in direct sunlight. Additionally, the temperature of the sheet and time needed to equalize in outside to inside temperature of the fabrication shop may vary. When using sheets that have been stored outdoors, note that adhesive reaction time and bond may vary.

5. TOOLING

5.1. Equipment and Tooling

Any shop fabricating HI-MACS solid surface should have adequate equipment and hand tools to be able to fabricate and produce a professional finished product. The following is an overview of the tooling required. This list is not intended to be all inclusive and is subject to change of modification as new types of equipment or tooling becomes available.

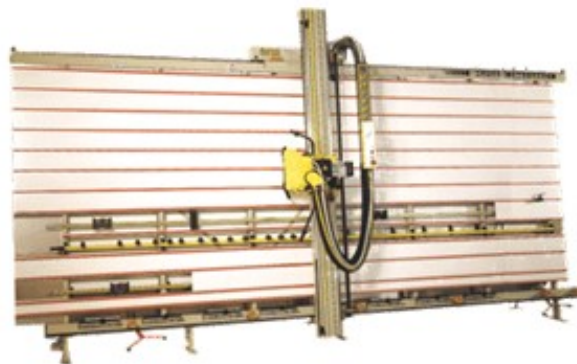
- Table Saw
- Vertical Panel Saw
- Radial Arm Saw
- 1 ½ HP Routers
- 3 HP Routers
- Orbital Sanders
- Palm Sanders
- Stationary Belt Sander



In addition any fabrication shop must have a dust collection / extraction system. Even though HI-MACS dust is non-toxic, dust collection should be provided at all cutting locations, and if possible, at each piece of equipment.

An advanced fabrication facility may also contain some of the following equipment;

- V-groover
- C.N.C. router
- C.N.C. panel saw
- Shaper



5.2. Blades & Bits

Saw blades and router bits are essential for proper fabrication. These items are subject to wear and should be sharpened regularly and replaced when necessary. There are a large variety of blades and router bits available specifically for the solid surface industry. Over time you will determine which brands and types produce the best results for your shop.

Caution: Any minor cuts or chips can lead to stress risers that can cause the sheet to crack.

5.3. Other Tooling

This list is a basic overview and is not meant to list all tools required for a fabrication shop.

- Clamps and clamping systems
- Straightedges
- Work tables
- Storage racks
- Hole saw
- Hot glue
- Adhesive guns
- Shop vacuum
- Grounded extension cords
- Abrasive pads
- Sandpaper (various grits)

Be aware that there are many types and grades of sandpaper being used today. Refer to section 14 FINISHING for more details.

Tools that should **NEVER** be used for fabrication of HI-MACS:

- Jig Saw
- Reciprocating saw
- Hack saw
- Auger bit

6. TEMPLATE

6.1. Template Methods and Materials

Templates are made to accurately transfer the dimensions and conditions from the project site to the fabrication shop. For the most basic job, field measurements may suffice. Due to the complexities of most kitchen countertops, a template representing the actual layout of the countertop to be constructed is preferred.

The first step in capturing information on any project is to sketch a plan view of the job. This is the basis of all of the work to be performed. On a typical kitchen countertop, include the following:

- Sink location
- Cooktop location
- Appliance locations
- Finished edges
- Overhangs
- Corner radius
- Pass through's
- Backsplash
- Special cut-outs
- Any unusual conditions

Templates can be made from any type of rigid material that retains dimensional stability during transport and handling. Styrene, wood, plastic, and cardboard are just a few of the templating materials that have been used for this purpose.

Use the template material to construct a dimensionally exact representation of what the HI-MACS countertop will be when complete. Place notes on templates to aid in fabrication – for example “corner out of square”. Avoid notes such as “add 2 inches” as this could be missed and cause the top to be fabricated incorrectly.

Check the templates to make sure all pieces fit together and account for the complete job. Where appropriate, label the templates with numbers or letters that correspond to the job sketch.

Always put the project name or customer name on each template.

There are numerous electronic templating methods available which all share the advantage of providing output as electronic files for CNC's. Each method has features and benefits that should be carefully evaluated prior to selecting an electronic templating system.

7. LAYOUT

7.1. Layout of Job

Before cutting any sheets of HI-MACS, calculate the number, lengths, widths and elevation to double check the amount of material you will need to finish the entire project. If you come up short it may create yield problems and dye lot concerns if more material must be ordered. You must also remember to consider cutouts, backsplash materials and buildup strips. As you look at all of these factors consider the cutout sizes and locations, substructure requirements, seam locations, possible inlay issues and specialty fabrication, such as a cove backsplash or thermoformed surface requirement.

7.2. Color Matching, Sheet direction

Inspect all material prior to fabrication. Note that some veined material has a directional pattern or veining. Layout HI-MACS sheets to provide the customer with the best visual appearance.

- Inspect run numbers
- Color match is guaranteed within 50 consecutive run numbers
- Remove peel coat and inspect for color variation, color match and defects
- Veined or directional patterns will require more specialized layout
- With directional patterns, consider also edge build up and backsplash matching

For Marmo sheets cut both sides of the sheet approximately $\frac{1}{2}$ " to $\frac{3}{4}$ " to obtain consistent pattern and veining characteristics. This cut off material can also be used for the build-up strips, seam blocks, etc.



7.3. Seam Location, Inside Corner Restrictions

- Determine seam locations. Avoid locations;
 - Within cutouts
 - Less than 3" from a cooktop or sink cutout
 - Over dishwashers
 - In corners
- Wet the edges between sheets to be seamed to help determine color match.

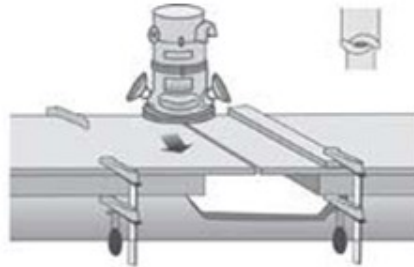
Seams in corners must be offset by a minimum of 3". A minimum corner radius of 1" is also required. See section 8 SEAMING for additional information.

8. SEAMING

8.1. Seam Placement

Careful placement of seams can be the difference between a great job and one that becomes a disaster. Traditionally, seams in solid colors are the hardest and leave the least amount for error. It is very important when seaming solids that you thoroughly clean the seams and prepare a precise mirror cut. Seaming with particulate colors (Sand & Pearls, Quartz & Granite, Volcanics, etc.) of HI-MACS are more forgiving. Seams in corners must be offset by a minimum of 3". A minimum corner radius of 1" is also required.

The best seam will typically be 2mm thick or less. Anything up to about 5mm is acceptable, but may be more visible depending on color used. Any seam greater than 5mm will generally be visible and produce a line the same color as the adhesive used. Since the adhesive is solid in color, it becomes very visible with colors containing particulate.



8.2. Seam Preparation

Here are two acceptable methods that will ensure a great seam.

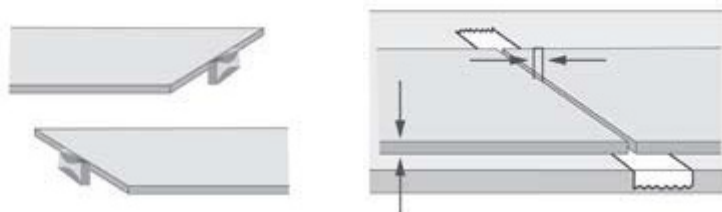


1.) Mirror cut the two pieces to be seamed together and do so at the same time. This is performed by setting a straight edge in place on one of the pieces to be seamed and also clamping down the two pieces to be seamed. Maintain a gap approximately 1/4" greater than the shank of the bit. It will take approximately 1/8" off each of the pieces that will be seamed. A square base router will help the accuracy. With one controlled pass of the router, you will make these two "mirror" edges simultaneously. The two pieces will fit together exactly.

2.) The other method is to do the exact same procedure, but use a wavy bit instead of a standard plunge bit. Using a wavy bit suggests a greater surface area for bonding.

You can also achieve extremely accurate cuts by using a C.N.C., Vertical Panel Saw, or V- Groover.

Scuff-sand the edges with a 90 degree block plane or right angle block and 60 grit sandpaper. This will ensure a greater bonding surface than if you do not.



Make sure to clean the joining edges with denatured alcohol and a clean white rag. Apply a strip of box tape or packing tape to the underside of the area to be joined, half on each side of the two pieces. This will create a bridge. Leave about 1/8" between pieces before applying the tape.

8.3. Adhesive Use

Assemble the cartridge in the seaming gun with a fresh disposable mixing tip. After each use, remove and replace this tip. The adhesive in the tip will set up just as the seams do on your materials. To ensure the best bond, remember to keep up the maintenance of your mixing tip. If you are finished gluing for the day, you can leave the tip on and place it in your storage refrigerator. The next time you use it you only need to change the tip. As you get ready to apply adhesive and begin assembly of your LG HI-MACS top, remember to purge the tip. This is done by squeezing out a bead of approximately the length of the tip. This ensures that any trapped air has worked itself from the mixing tip and that the catalyst and adhesive have properly mixed and are ready.

Normal cure time is about 40 minutes in 70 degree F, 21 degrees C. If the temperature is hotter, your working time is greatly reduced and, if cooler, your working time is lengthened.

Bulk adhesive cartridges typically provide 40' of seaming.

8.4. Clamping Systems

There are a number of clamping systems in use today including spring clamps, bar clamps, "C" clamps, PVC rings, and vacuum systems. Each type is suitable in one or more applications in the HI-MACS fabrication process. By-and-large, it is a matter of individual preference.

Clamping Tips

- Do not use excessive pressure. This will create a dry seam (squeezing all the glue from the seam)
- Clamp pressures should be tight enough to allow a bead of adhesive to squeeze out.
- The adhesive will shrink slightly, so do not completely clean off the seam of excess adhesive.
- Look for glue voids and air pockets. Take care of this before the seam adhesive sets up.

- Inspect the seam to ensure a tight fit.

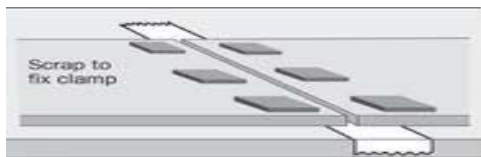
Let the adhesive cure for a minimum of 40 minutes in normal conditions or until hard to your fingernail touch. Remove the excess adhesive by “Leveling” the seam with a router with a set of skis and a small leveling bit. Do **not** use a belt sander to perform this operation. Excessive heat will weaken the integrity or fail the seam all together. Finish sanding all surfaces to specified finish.

8.5. Seam Reinforcement

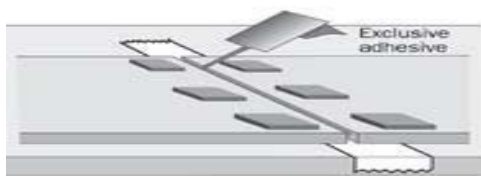
Seam reinforcement materials should be fabricated from 1/2” (13mm) HI-MACS materials. The reinforcement must be continuous along the entire seam. This 3” reinforcement strip must be beveled to 45 degrees and sanded smooth to reduce the stress riser. Avoid stress risers. A stress riser is a sharp or rough cut or corner that weakens over time as the top expands and contracts. This weakening effect will eventually fail the top and a crack in the countertop will occur. Locate reinforced seams where full support is available. Reinforcements can sometimes get in the way of the overall support structure. Keep the nearest edge of the seam support a minimum of 3” from inside corners.

Note:

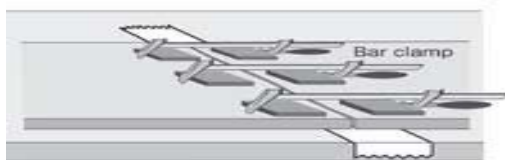
- Do not place a seam over a dishwasher
- Do not place a seam through a sink



Attach scrap material or wooden blocks with hot melt glue.



Apply adhesive into the seam.



Use clamping devices to pull the pieces together. Do not over tighten. This will cause a starved or “dry” seam.



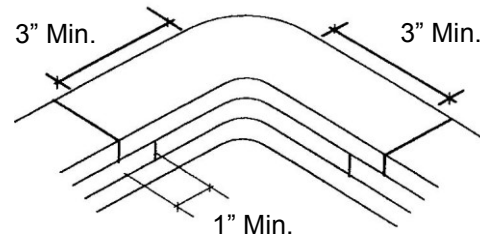
Remove clamps and blocks after seam has set.

Rout off the adhesive squeeze-out using a router with skis – set to

route just above the material surface.

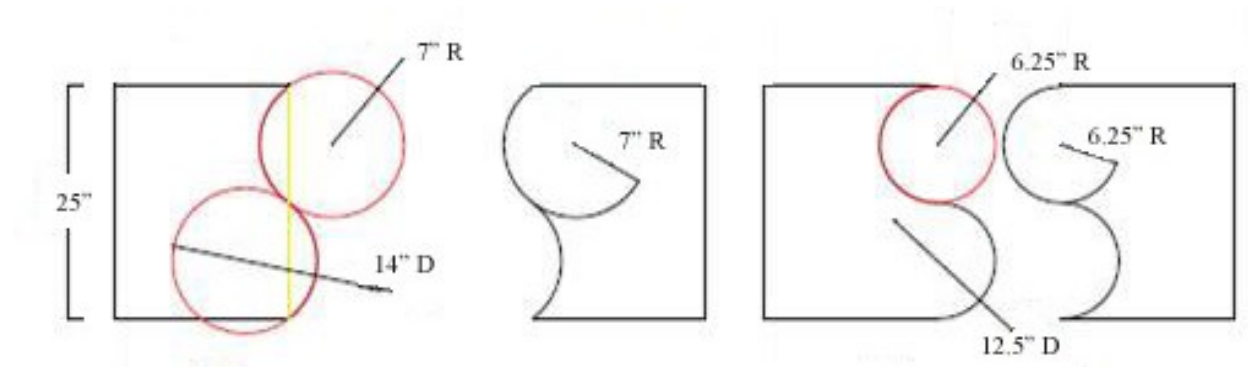
Sand the seam flush using an orbital sander.

LG HI-MACS requires a minimum 1" radius on all drop edge inside corners.
(Bottom View Diagram indicates recommended build-up)



1) S – Shaped Seam

This method is an alternate procedure that can be used in fabrication of HI-MACS with veining or directional pattern (such as the Marmo collection). Cut the Marmo material to an 'S-shaped' configuration using a template or NC machine and join the surfaces in the same manner as shown below.



Cut both pieces to be seamed with an identical "S shaped" pattern. When seamed together the offset seam will not be as visible as a straight line seam.

9. CUTOUTS

9.1. Sink

You can either bevel mount or undermount your HI-MACS sink or vanity to your HI-MACS countertop or vanity to create a monolithic appearance smooth to the touch and crisp and clean to the appearance.

9.2. Top Mount

- Cut the opening in the countertop approximately 1" larger in length and width than the sink is to be mounted. Make this cutout with a router only! This opening should then be sanded to a smooth finish.
- Apply a 1/4" (6mm) bead of 100% silicone to the bottom edge of the self rimming sink flange and also to the edge of the routed cutout.
- Position the sink into the cutout so that the flange rests on the deck. Make certain to install the clips or clamps supplied, but remember not to screw anything directly into or onto the HI-MACS materials. Attach to the underlayment at the sink opening or adhere wooden blocks when necessary.

9.3. Under Mount

The most typical dissimilar sink or vanity will be comprised of Stainless Steel, Porcelain, Cast Iron, Ceramic or Glass. These sinks can be top mount, self rimming or under mount.

- Make a template if one is not provided of the required size for the cutout.
- Sand and finish the routed edges to provide a smooth surface.
- Leave enough room at the back of the countertop for the faucet assembly, edge buildup backsplash, and respective sink flange.

Note; the following steps are usually performed at the project site.

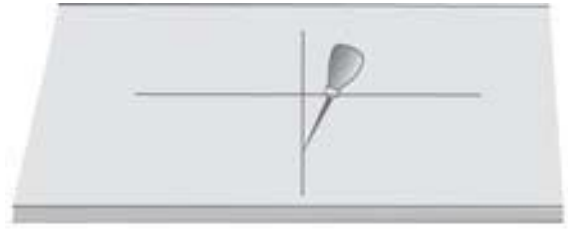
- Apply a 1/4" (6mm) bead of 100% silicone to the top of the sink flange and to the bottom of the HI-MACS counter top at the flange perimeter edge.
- Position the sink equally around the cutout and install sink clips or clamps supplied, but remember not to screw anything directly into or onto the HI-MACS materials. Use a wooden block when necessary. Always use mechanical fasteners with dissimilar material sinks. Never depend solely on glue, epoxy, or caulk for adhesion.
- ♦ When under mounting a cast iron sink, it must be supported from the cabinet. Often a cradle must be constructed inside the sink base cabinet to support the sink from the walls and floor of the cabinet. Never try to under mount a cast iron sink from the cabinet sub top or support strips.

9.4. Mounting HI-MACS sinks to HI-MACS sheet materials

A seam mount in solid surfacing is gluing the top of the sink flange with adhesive to the bottom of HI-MACS sheet materials. For this reason, all typical bonding steps are performed on an inverted or flipped sheet, thus exposing the bottom of your countertop.

- Most fabricators will perform all steps in an inverted fashion, with the exception of final trimming with the router and finish sanding.
- It may be helpful to make sure you have a work table/bench with an opening wide enough in the center to flip the top into once the sink is installed for final trimming and finishing. Such a table/bench will provide proper support all around the sink and countertop.
- Mark the center location of the bottom of the sheet where the sink will also be centered in the sink base cabinet.
- Once you dry fit the bowl into final position, draw an outline around the sink/bowl.
- Completely sand and then clean the surface of the sink flange and the area on the bottom of the sheet inside the outline that will have adhesive placed on it.
- Place the sink/bowl back into position inside your outline.
- Attach blocks made of wood or scrap LG HI-MACS material with hot melt glue against the outside edge of the flange. Once the glue has dried the sink will remain in position.
- At this point you can place a bead of adhesive on the flange of the sink or bowl and on the outline on the sheet.
- Place the bowl inside the positioning blocks and attach clamps or weights to ensure adequate and equal pressures as the adhesive is setting up. Depending on the bowl, it may be necessary or required to install sink clips or brackets to aid in the sink support. It can be noted that if you notch the positioning blocks to produce an “L” block, you can create your own support bracket.
- Once the adhesive is dry, carefully flip the top upright. Place your router in the center of the bowl and plunge an approximate 1” hole through the sheet. Make sure you now put a bottom bearing bit in the router and follow the interior of the bowl as a guide. The bearing will follow it and the excess cutout material will be removed.
- Change your bit to a finish profile bit with a bottom bearing guide and finish routing the final profile to the deck and bowl. It can be a smooth transition appearing as a monolithic top and bowl or a small bullnose to provide a transition lip.

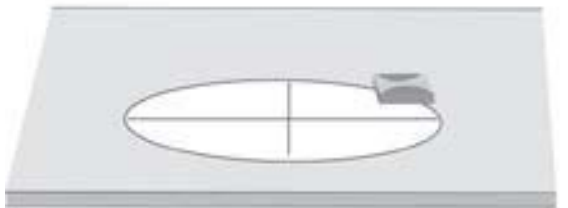
1 Scribe the centerlines



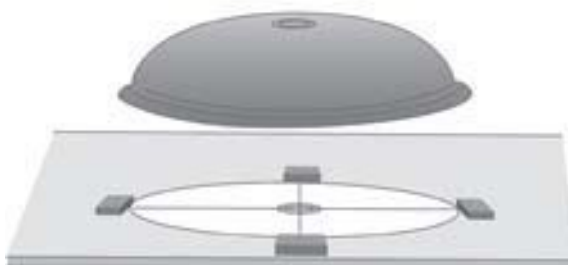
2 Scribe the outline



3 Sand the sheet in the area to receive the sink flange



4 Attach blocks w/ hot melt glue



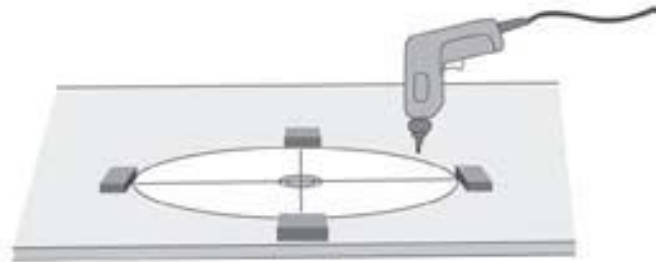
5 Sand the sink flange



6 Clean with denatured alcohol



7 Plunge cut a hole in the center of the cutout



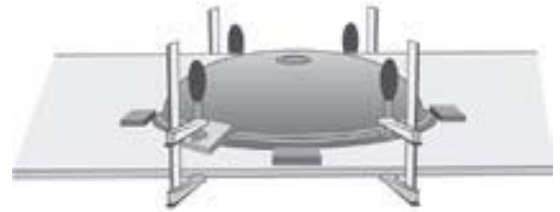
8 Apply the adhesive to the bowl flange



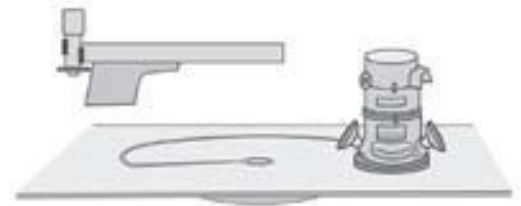
9 Place and attach the bowl



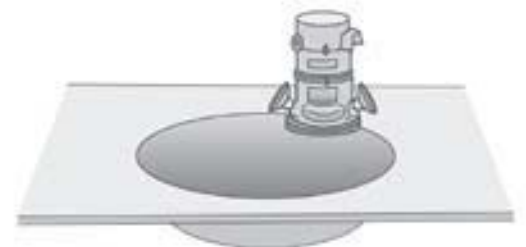
10 Attach with clamps until the adhesive has set



11 turn the assembly over and route the sink hole



12. Various edge profiles are possible using different
Router bits

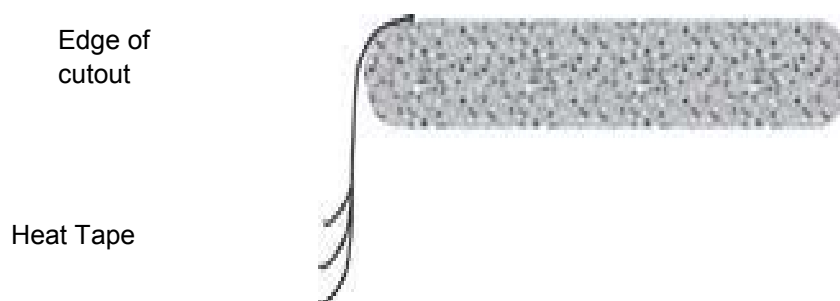


9.5. Cook top

Countertops and heat generating appliance applications remain one of the biggest challenges to Solid Surfacing. The heat generated in various types of appliances constantly challenges the limits of solid surfacing materials. Fabrication techniques have improved over time and a lot has been learned to avoid most failures in such conditions. It remains true that solid surfacing can take the heat, but must have an outlet for venting or dispersion in order to keep the temperature under critical performance limits.

PLEASE NOTE THAT DEVIATIONS FROM THESE FABRICATION PRACTICES WILL RESULT IN VOIDING THE PRODUCT WARRANTY

- Only use a router to cut out the countertop.
- Make certain you ease the top and bottom of the cutout with a 1/8" (3mm) roundover.
- After rounding the cutout profile, remember to finish sand any chatter smooth to 150 Grit.
- Make sure to make the cutout as large as possible, keeping in mind that it must still have the ability to properly support the cook top.
- Create a 1" radius (13mm) at all inside corners.
- Apply a minimum of 1 layer of heat conductive foil tape (preferably two or three layers as illustrated below) to the edge of the cutout. Place these layers so that the first layer of tape rests on the entire flange of the countertop. You can carefully trim any excess tape after final installation.
- As you apply the second and third layer of tape, remember to fan them out like fins. This will increase the surface area for the heat to travel, and this increased surface area will also assist in faster dissipation of trapped heat. This will serve to minimize the exposure of HI-MACS to heat.



Reinforce corner cutouts using corner blocks. It is recommended to reinforce corners of cooktop cutouts using corner blocks.

- A corner block is placed at each corner of the radius cut cooktop cutout and should be installed just after the cut out is routed. These blocks are placed on the bottom side of the sheet and will be adhered to the cooktop with adhesive. Do not ease the cutout or finish sanding until these blocks have been installed.

- 4 blocks are prepared by using pieces of HI-MACS ½" sheet materials. These blocks should be a typically 6" square.
- Once the blocks have been cut, make sure you bevel or chamfer the edge to 45 degrees and round the square corners to eliminate the chance of creating a stress riser. Scuff-sand and clean the surface area of the blocks and bottom of the sheet to be bonded.
- Place adhesive on the block thoroughly and position the block so that a 3" X 3" surface area of the block, extends from the routed cooktop cutout. Clamp in place until adhesive is set.
- Trim the excess material from the blocks on the inside of the cooktop and any extensions or protrusions in the front or back edges of the deck.
- Ease the top and bottom of the cutout and support block materials with a router and finish sand to a 150 Grit finish.
- Apply the three layers of heat tape as previously described.

9.6. Accessories

Cutouts for accessories should follow the same process and procedures as outlined in sections 10.2. to 10.5.

10. EDGES

Please follow the following standards when fabricating and profiling HI-MACS edges.

10.1. Horizontal Stack

- Scuff-sand all surface areas to be bonded or adhered to using 60 grit sandpaper.
- Clean all sanded areas with denatured alcohol.
- Make certain that your build-up strips are the same width. Do not allow the bottom build-up strip to be wider than the middle strip. This will cause a stress riser.
- Once you have applied the seam adhesive, place a spring clamp every two inches from the center at a minimum. It is recommended that all the spring clamps are the same size in order to ensure consistent pressure. Slippage is a common phenomenon. When you clamp the edges down, they have a tendency to slide or slip a bit. If you are having a hard time controlling this, place a small block behind the seaming strips and hot melt this in place. This should stabilize the slipping and keep your front edge straight while the glue dries. When finished, remove the block from behind the strips.
- Take extra care and attention to detail when fabricating inside and outside corners. These corners provide an important structural integrity to the countertop and its longevity.
- It is recommended that you use a small bar or pipe clamps at the inside corner using moderate pressure.
- Do not leave glue voids on butt seams. Make certain these seams are scuff-sanded, cleaned and completely covered with adhesive to avoid inadvertent stress risers being built into your inside corner.
- Whether you stack the edge or sandwich it, remember to create at least 1/2" to 3/4" of adhesive between the deck and build-up strip. If you stack a 1" piece of build-up to the edge of the deck, remember to include a support block made of wood. Leave a 1/8" gap between the wood strip and build-up strip to fill with silicone for expansion. Also chamfer or bevel the wood to allow the adhesive of your build-up strip to have an area to create a bead of excess adhesive. Please remember that dissimilar materials coming into contact with one another must use 100% silicone adhesive to buffer them.
- Do not use the square block method when you have an outside radius. You want to alternate the stacking of the build-up strips in a weaving manner. Remember to scuff sand and clean all edges and surfaces to receive adhesive.

10.2. Vertical Drop

In this type of edge, a vertical strip of HI-MACS is adhered to the underside of the deck. Typically this can accommodate taller flat edges or aprons. Fewer types of profiles can be applied to this type of edge. A support strip of wood must be used behind this build-up strip after it is glued in place. This wooden strip should be adhered with 100% silicone 1/8" behind the drop edge build-up on your countertop.

- Scuff-sand all surface areas to be bonded or adhered to using 60 grit sandpaper.
- Clean all sanded areas with denatured alcohol.
- Make certain that your build-up strips are the same width.
- Place small stop blocks behind the drop edge strips and hot melt in place.
- Apply the seam adhesive and place clamps every few inches from the center. Take care to maintain consistent pressure.

- Take extra care and attention to detail when fabricating inside and outside corners. These corners provide an important structural integrity to the countertop and its longevity. Fabricate laminated corner blocks from HI-MACS sized to accommodate the corner radius and maintain sufficient interior or exterior corner support after profiling.
- Alternately, you can use a thermoformed corner piece formed to the specified radius.

10.3. V-Grooved

- A V-Groove machine can be also used to produce drop edges, coved backsplash, etc.
- Follow the manufacturer's recommendations to set up and cut the HI-MACS components.
- Clean the v-grooved areas with denatured alcohol and apply adhesive in the groove.
- Fold the edges and clamp in place until the adhesive sets.

10.4. Inside Corners

- When creating an inside corner, it is best to stack the edge build-up by alternating layers with a 1" offset between butt joints on these layers.
- Remember when building an inside corner to place the buildup strip butt joint a minimum of 3 - 4 inches from the center line of the corner itself in either direction and alternate the second and third layer with a minimum of 1" offset between butt joints. All typical bonding steps are performed on an inverted sheet.
- Corner blocks of laminated HI-MACS should span the depth of the edge strips plus 1" beyond the dimension of the corner radius.

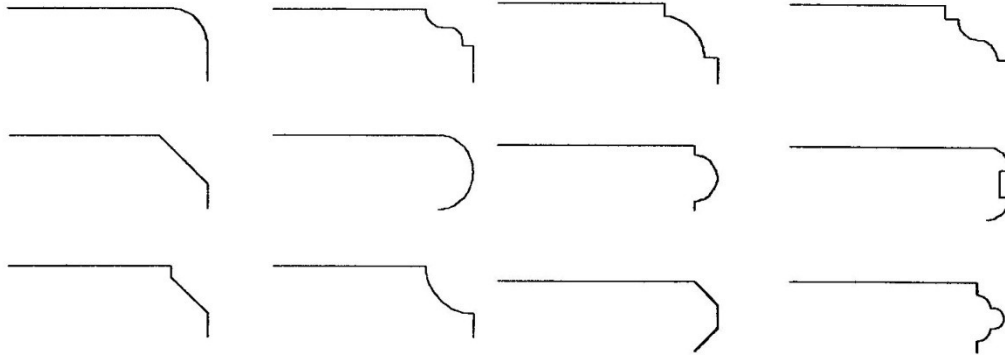
10.5. Outside Corners

- When creating an outside corner, lay out your build-up strips by overlapping the second and third layers below the deck (typical for creating a 1 - 1/2" edge).
- An alternate method of creating an outside corner is to copy the inside corner method. When stacking the outside corner build-up strips, make sure to maintain a 1" offset at a minimum between butt joints on alternate layers. You must maintain a minimum of 1" on an outside radius using this method and no more than a 5" radius without using a wider build-up strip.

10.6. Profiles

HI-MACS solid surface has the unique ability of providing the machining ability for fabricators to exercise their design creativity when producing edges. With the multitude of bits available to the fabricator and terrific adhesives, there are almost endless possibilities for edge profiles.

The fabricator skill level will come into play when considering the level of difficulty in executing edge ideas. Edge build-ups are typically 1 - 1/2" and occasionally 2" thick. Aprons for commercial work are a generally 3" but can be larger depending on the application.



Variety of Edges

11. BACKSPLASH

11.1. Loose

For installation of Backsplash materials from 2" - 6", follow these directions:

- Cut the splash from the same materials that were used on the countertop fabrication when necessary.
- If you produce back splash materials from strips purchased at your distributor or with materials purchased at a different time, they may not match in color. Always check for color match before fabricating.
- Prepare the strip by sanding and edge-profiling, if required, prior to installing.
- Dry fit the splash materials to ensure all joints and edges are tight.
- Scribe the back splash to the wall or countertop if necessary.
- Install the backsplash materials with 100% silicone adhesive. Place dabs of silicone every 4 - 6 inches on the back side of the splash materials that will come in contact with the wall. Prior to setting the splash into position, run a thin bead of clear or color matched silicone on the back surface edge of the countertop where the splash will rest.
- Put the splash material in place and remove excess silicone squeeze from the joints and finish caulking operation.

11.2. Coved

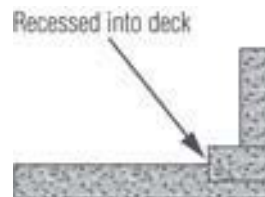
Cove backsplashes are fabricated in the shop. Specialty routers, tools and procedures are necessary to successfully fabricate a coved backsplash. It should be noted, however, that standard solid surfacing routers and saws can be used, providing the fabricator is skillful and patient. The most important thing to note is the time necessary to create a coved splash, which typically reflects in the cost to your customer. This cost will vary depending on shop equipment, frequency, and proficiency with this type of work as well as the time necessary for finish sanding.

- In order to make a cove backsplash, it is recommended to rabbit into the backside of the counter deck in 1" from the back edge of the counter deck. This notch should be approximately 1/8" at a minimum depth. This will create a pocket for a LG HI-MACS 1" square cove strip to be placed into.
- Cut two 1" X 1/2" thick pieces LG HI-MACS and glue them to the counter deck in the notch (Rabbit) you have created. You will need to prep the materials with denatured alcohol and a clean white rag on the deck and strips. Place the adhesive thoroughly in the deck notch and place the first strip flat into the rabbit created. (Place the 1" strip in the 1" rabbit flat on the edge using the 1/2" thickness) Once the first strip is put in place, apply adhesive to the top of the first strip and place the second strip on top in a horizontal stack method as used in edge build-ups. Place the spring clamps into position using the clamping procedures outlined in this manual.
- After the adhesive has dried from the strips, it is time to cut the backsplash material you wish to incorporate into the top. This backsplash can be standard, full height or a custom height selected by the customer. Remember, the full height splash is much more difficult to control as you fabricate it in place and in the transportation and installation process.
- As you apply the desired backsplash strip, remember to thoroughly clean the edge you wish to apply adhesive to. Put the adhesive to the back face of the top strip you adhered earlier and place the strip on the glue line. Use bar or pipe clamps to hold the splash in place as the

adhesive dries, and remember to use a square to adjust pressures so that the backsplash will remain straight and at a right angle from the countertop surface.

- Once this has dried, you will want to remove the excess material with a cove router. The depth and arc angle of the cut should be tangent to both the deck and backsplash.
- The balance of this operation is sanding the cove you have created. There are power sanders that have been developed, but some hand-sanding will be required for the best results and quality of finish.
- Use the same procedure and steps to create the inside corner cove on an “L” shaped return on the countertop. Another method is to create an inside corner cove block that is prefabricated. It can then be bonded to the inside corner, which is finished in the same manner.

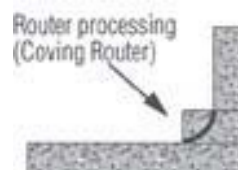
On coved splash (Type A) the cove strip assembly must be recessed into the deck 1/8” to eliminate “feather” at glue line.



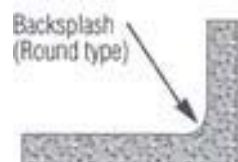
Apply adhesive to assembly as shown



Use specialty cove router to fabricate



Sand profile after fabrication



11.3. Full Height

The same steps and procedures are used when installing full height backsplash materials with a few exceptions:

- If using full height splash in either 1/4" (6mm) or 1/2" (13mm) LG HI-MACS materials, remember to allow a 1/8" (3mm) gap below the upper cabinets for expansion.
- Make cut-outs only with a router and maintain a 1/2" (13mm) minimum radius on all inside corners.
- Adhere to wall with silicone - never use panel adhesive

11.4. Tile Backsplash and other dissimilar materials

When tile or other backsplash materials are placed above a HI-MACS countertop, always provide an expansion joint between the dissimilar materials. The recommended gap should be $\frac{1}{8}$ " to $\frac{1}{4}$ " and filled with 100% silicone caulk.

12. COUNTERTOP SUPPORT

The best substrate for a HI-MACS countertop is made from moisture resistant plywood, solid hardwood lumber, or tubular steel. Other wood products may be acceptable as long as they are moisture resistant. Support strips should be attached to the cabinets in a “ladder frame” configuration. Always avoid MDF, Particle board or Flake board. These materials are not stable and are subject to warpage and expansion with the presence of moisture. Follow the procedure below using any of the approved support materials.

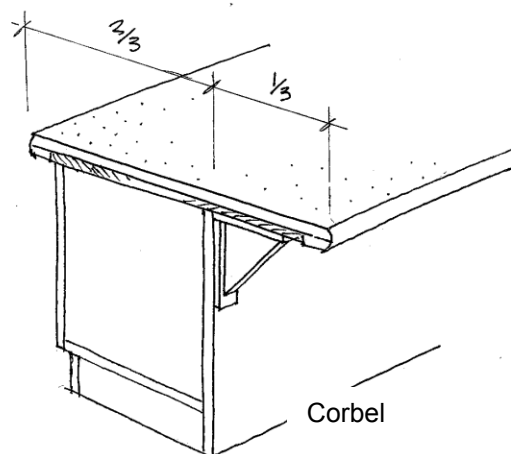
12.1. Support Structures

- Do not use solid substrates, especially around heat generating appliances in the installation. Wood and related wood products do not conduct or dissipate heat produced by heat generating appliances.
- Substrate materials to avoid are MDF, Particle Board, OSB, and any non water resistant composite wood products.
- If the cabinet has full dust covers, it is recommended to remove at least one half of the cover prior to top installation.
- You can use a full substrate with approved wood or wood product materials on furniture, table tops or related service counters, provided that no heat generation appliance is present.
- All cabinets must be leveled and shimmed as necessary to 1/16” tolerances prior to countertop final installation.
- Apply perimeter support strips to the cabinet surfaces. You will need to install center support stringer materials across the cabinets for support. These support strips can be nailed with a finish nail and countersunk, or screwed into place provided the head is below the surface of the wood support that will come in contact with the HI-MACS countertop deck.
- Place stringer/support strips 12” apart.
- Do not span any unsupported opening over 24”.
- Any leveling necessary should be performed between the cabinets and the support strips.
- After the support system is installed and leveled, you will be ready to begin installation of the HI MACS top.
- Use 100% silicone adhesive to bond LG HI-MACS surfacing materials to dissimilar materials such as wood, steel, aluminum, etc. Do not use Liquid Nails or similar non flexible panel adhesives. The purpose of the silicone is to allow the top to expand/contract as it needs to. Silicone allows for this to take place. Panel adhesive restricts this motion resulting in failure to the top and voiding the warranty.

12.2. Overhangs

Never allow more than 1/3 of the width to overhang while two thirds of the width should be supported. If this rule cannot be followed, you must install legs for necessary support.

- Using support strips, a maximum of 6” overhang is allowable without corbels. A full substrate on a overhang with a web support over the cabinets is the preferred method of support.



- For overhangs greater than 6" but less than 16" use corbels spaced no more than 24" apart. Alternately you can use a 1" tube steel framework spaced no more than 24" for support.
- An overhang of more than 16" will require legs.
- Other types or combinations of support methods may be possible. The HI-MACS warranty will not be voided as long as all of the following criteria are met:
 1. The overhang does not exceed 1/3 of the supported width of the top.
 2. Maximum edge deflection does not exceed ¼" under an applied load of 100 lbs.
 3. No portion of the HI-MACS spans more than 24" without support.

Note; As a manufacturer of solid surface sheet product, LG Hausys does not review and/or approve specific details for project specific applications.

12.3. Miscellaneous Support

- Support must be provided at the back of the cabinet (where it meets the wall) in all cases. If there is no support (for example, at the back of a dishwasher opening), a cleat needs to be securely fastened to the wall level with the cabinets. This gap cannot be spanned by support strips alone.
- In many cases, corner cabinets with lazy susan's do not provide adequate support or have excessive spans. Additional support may need to be added prior to installation of countertops.
- Never screw through support strips into the HI-MACS material. This will void the warranty as it will eventually cause the material to crack.
- Do not attach appliances such as dishwashers, directly to a HI-MACS countertop. Use side clips to attach to the cabinet whenever possible.

13. FINISHING

HI-MACS sheet materials are factory sanded prior to the protective peel coat application. The result of this superior quality factory finish translates to less final sanding time in the shop or on the jobsite. Sanding is a very important part of the fabrication process. Finish considerations can make or break the aesthetic value of your surface. Be very sure to sell a finish that is right for the color and lifestyle of the customer. Do not oversell the performance of a specific finish, especially in a darker color selection and in a satin or gloss finish. The result could be expectations that can never be met. Clearly explain the performance of a finish option to the customer.

Caution; Satin or gloss finish will show scratches more readily than a matte finish. Matte is the finish recommended by LG Hausys for most surfacing applications.

Caution; All dark colors of any surface material, including HI-MACS require more maintenance to maintain their appearance. Under ordinary use, darker colors will show dirt, dust, scratches, rubs, fingerprints and watermarks more readily than lighter colors and patterns. For this reason, we recommend periodic professional maintenance in order to renew surfaces to their original finish.

13.1. Overview

The sanding and finishing process can be the most time consuming process of fabrication. Additionally, it can be confusing to the fabricator because of the multitude of sanding equipment, systems and sand paper companies available to the fabricator. As you decide the best equipment and sanding papers to incorporate into your fabrication process, remember to purchase good quality sanding equipment and sandpapers.

- Make sure to remove excess adhesives with a surfacing router equipped with a system of skis. Avoid use of a belt sander as it generates a great deal of heat and can fail a seam. Furthermore, the belt sanding equipment is very aggressive and can remove material quickly. You can quickly create more problems for your countertop fabrication if more material is removed than is supposed to be. You want to maintain control in the sanding process.
- An important step in the process of sanding is to thoroughly clean the top between steps or grit changes. You can do so with a spray bottle of water or preferably denatured alcohol and a clean white rag. Cleaning off sanding dust between steps allow for a more consistent and high quality finish.
- Apply equal pressure and overlapping coverage in both directions of the top. For example, left to right and front to back. Complete one direction before starting the other.
- Change or clean your sandpaper as you sand as it will get loaded and become less efficient. As you get to a more detailed finish the sandpapers will load more quickly. If care is not taken to keep the sandpaper clean, it will impair your ability to achieve a high quality, consistent finish. In a gloss situation, you may never achieve it.

13.2. Matte Finish (Preferred)

- To achieve a matte finish, you can either use a grit or a micron system. Remember the numbering system or grades of papers between grit and micron systems are opposite to one another.

- First, use a 120 Grit or 100 micron abrasive. Once this step has been completed, remember to clean the top and switch papers to a 180 or 220 Grit or 60 Micron paper.
- Finally, clean the top once again and surface the top with a #7447 Scotchbrite pad.
- If you are working with a dark or black color, you may have to add an additional third step in sanding. This will require a 320-400 Grit or 30 micron paper. If this is done, you will then want to clean the top and then surface the top with a #7448 Ultra Fine Scotch brite pad.

13.3. Satin Finish

- If you wish to achieve a satin finish follow the same steps expressed to achieve a Matte Finish on a dark color. Use a 120 Grit/100 Micron, then switch to a 180-220 Grit/60 Micron. Remember to clean the top between steps.
- Next -
- You will want sand the top using 320-400 Grit/30 Micron paper. Clean the top.
- Finally, you will surface the top with a #7448 Ultra Fine Scotch brite pad. Clean the top once again and examine the final finish.

13.4. Gloss Finish

- Follow the steps to the Satin Finish specification, but do not use the #7448 pad yet. As you reach the 320-400 Grit/30 Micron step, you will need to add a few additional steps.
- Next -
- Sand the top using 600-900 Grit/15 Micron paper. Thoroughly clean the top. Remember to check the loading of your paper during the process and replace it frequently as necessary to maintain a consistent finish.
- Next - Polishing Procedures
- Remember to note that HI-Gloss finishes on dark colors are not recommended in high traffic areas, as the finish will show wear very quickly and require constant maintenance.
- Remember the polisher will build a lot of heat as you buff the surface with the polishing compounds. Maintain moderate consistent pressure to prevent overheating of the top and burnishing of the gloss finish.
- Use a 10" (254mm) variable speed polisher. Black and Decker offers a few models that can maintain 2500 RPM's and 8-10 amps of power.
- Install a 3M Buff Adapter to the polishing equipment. This is important so as not to allow the arbor to damage the surface in the polishing process.
- You must now install a white 3M Super Duty 2 + 2 Pad to the polisher assembly.
- Apply 3M Marine Paste Compound to the top. This paste is abrasive and will remove swirls to 30 Micron. You may need to repeat this step. Keep the buffer moving in a controlled fashion across the countertop and then from front to back across the countertop.
- Clean all compound residue from the polished surface. You can do so by reversing the white pad. Then clean the top with denatured alcohol and a clean soft white rag.
- Take off the White 3M Super Duty 2 + 2 Pad and replace it with a Yellow 3M Super Buff Polishing Pad.
- Apply 3M "Finesse-It" (#81235) Polishing Material to the countertop. Remove any remaining swirls to produce a high gloss surface.
- Clean all polishing residue from the polished surface. You can reverse the Yellow Pad to remove any residue left behind from this step.

14. THERMOFORMING

Thermoforming allows a fabricator to explore virtually limitless possibilities by heating and forming a sheet of HI-MACS into 3 dimensional shapes. HI-MACS sheet materials are well suited to use with thermoforming technology. A variety of shapes and configurations are possible by thermoforming the HI-MACS sheets. Sheets or cut pieces must be uniformly heated to achieve the desired results. Ovens used for thermoforming must be capable of fully containing the entire piece to be formed, and maintaining a consistent temperature during the heating process.

Caution – Large chip products are not thermoformable (Volcanics, Galaxy, Eden Plus).

Thickness of HI-MACS	¼"	½"
Oven temperature (°F)	320~374	320~374
Heating Time (Minutes)	20	40
Minimum Curve Radius (inch)	R=2"	R=3"

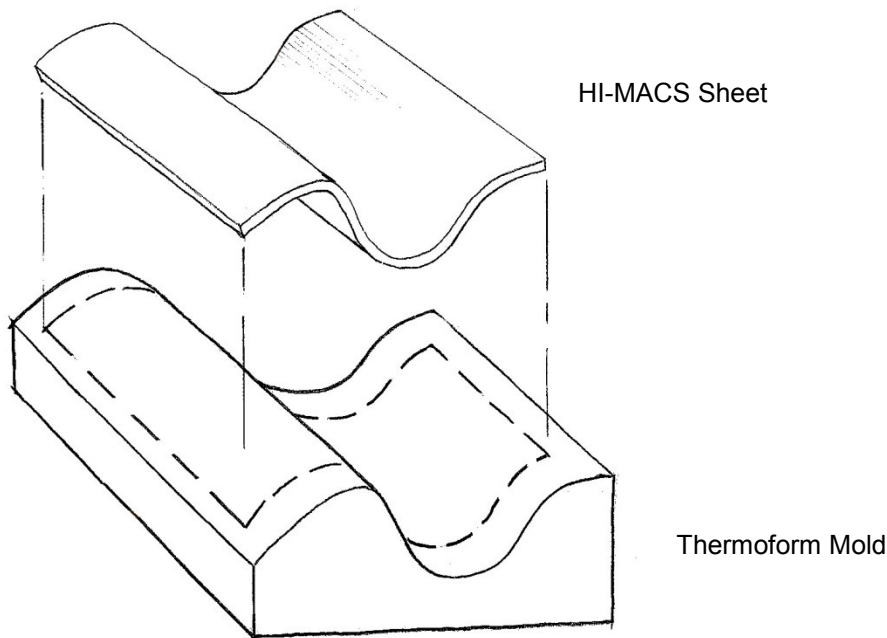
14.1. Overview

- Construct a mold of the shape required using plywood or MDF.
- Depending on the shape and configuration, male and female molds may be necessary. Molds can be simple or very complex.
- The quality of the mold constructed will affect the finished product.
- Any imperfections in the mold will be transferred to the HIMACS sheet being formed.
- The sheets need to be heated to a temperature of 320-370°F, but should never exceed 392°F.
- Heat 10 ~20 minutes, or more if you need the product with minimum curve.
- Please note that a whitening effect can be generated on the surface of the product if the temperature is too high or the heating is prolonged. Also be aware that the darker the color, and the smaller the radius, the more whitening there may be.
- Once heated to the required temperature remove work piece with heat resistant gloves from the oven and place directly into a mold. Allow heated material to shrink in the mold.
- Using moderate pressure, slowly form the work piece to the shape of the mold. This can be accomplished on basic shapes by using a series of clamps and hand pressure. More complex shapes may require helper pieces or even a vacuum forming press with a rubber membrane.
- Leave the sheet in the mold until the sheet has cooled down to 175°F (typically 20-40 minutes, for ½" material). Always wear heat-protection gloves for this operation.
- Never attempt any shock cooling as this can cause stress to the material.
- Attempting to bend HI-MACS at lower temperatures or shortening the heating cycles will often result in "whitening" or cracking at the radius bend.
- Do not take the thermoformed shape from the mold before the temperature reaches 175°F. The shape of product is maintained at temperatures below 175°F, even if the product is not supported by the mold.
- Normal sanding and finishing of the formed material can be carried out once the material is fully rigid.

Thickness of HI-MACS	¼"	½"
Cooling Time (Minutes)	10~20	20~40

14.2. Other Considerations

- Thermoforming using specialized equipment such as a heated platen press and a vacuum membrane press can yield superior results. Often the thermoforming process can be done quicker using this type of equipment. Please comply with all manufacturers guidelines – including all safety precautions.
- Do not thermoform pieces that have been seamed.
- Allow for shrinkage of material when thermoforming. this will vary depending on the shape, but can be 5% to 7%.
- There is a possibility of color change due to the heating process. Test form a sample to determine if the color of the finished product will be acceptable. If you are working with dark colors, you may see visible whitening of the material, particularly at sharp bends and tight radiuses.
- Defects, or irregularities in the mold will transfer to the sheet being thermoformed.



NOTE:

LG Hausys warranty covers manufacturing defects. All sheet goods should be inspected and any defects should be recognized prior to thermoforming. HI- MACS sheets transformed into three dimensional shapes are the responsibility of the fabricator. Furthermore, LG Hausys makes no warranty that the finished product is suitable for the intended application or purpose.

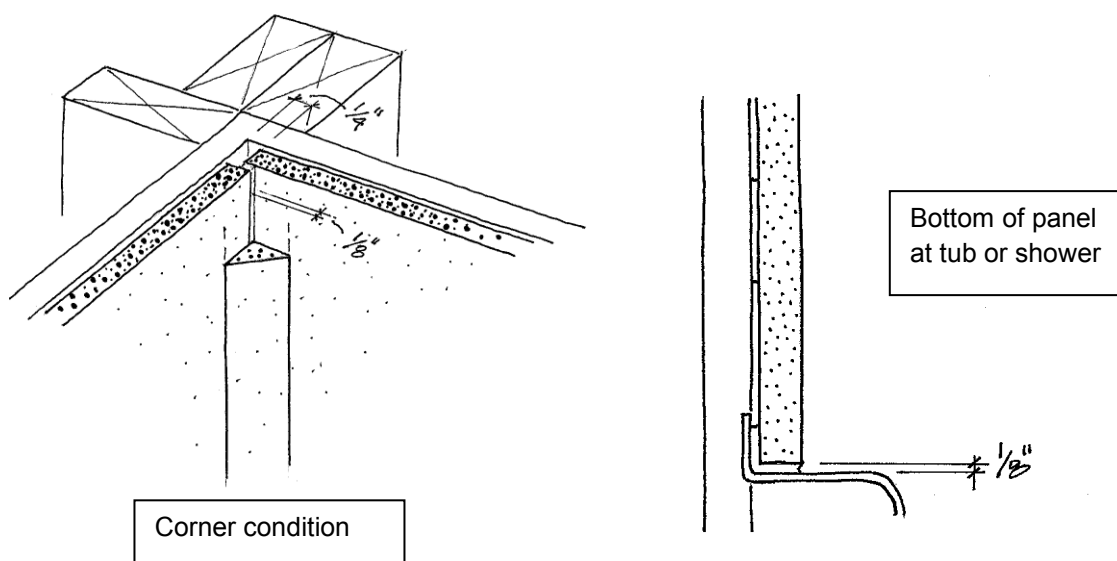
15. VERTICAL APPLICATIONS

HI-MACS sheets can be vertically mounted using either horizontal or vertical seams. Wall cladding pieces can be seamed together or joined using 100% silicone sealant. Either $\frac{1}{4}$ " or $\frac{1}{2}$ " sheet material may be used, however the $\frac{1}{2}$ " thick material will generally prove more durable.

Ensure that the wall surface that the HI-MACS sheets are being attached to is of sound construction and free of defects. If there is an expansion joint in the wall, an expansion joint of the same size and location will be required in the HI-MACS wall panel. Additionally gaps for expansion must also occur at inside corners, wall to floor, and wall to ceiling interfaces.

Please note that LG Hausys does not provide design review of drawings for any specific application or purpose. Nor will LG Hausys approve or reject a design as being a suitable use of our manufactured acrylic sheet product.

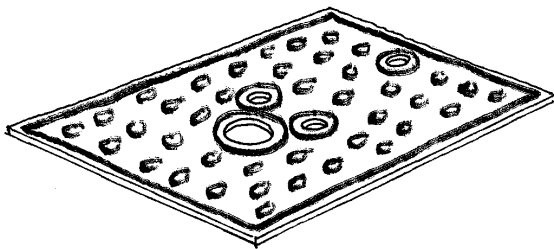
15.1. Wet wall



The variety of shower and tub configurations available in the marketplace are too numerous to cover in any manual. These guidelines will provide the basic instructions that will apply to all applications.

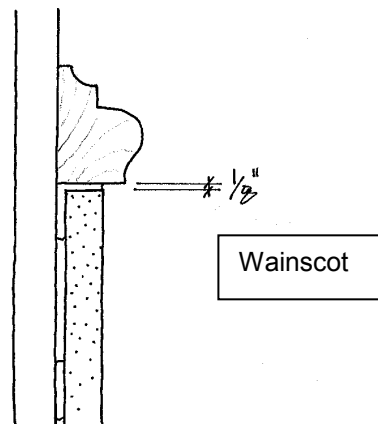
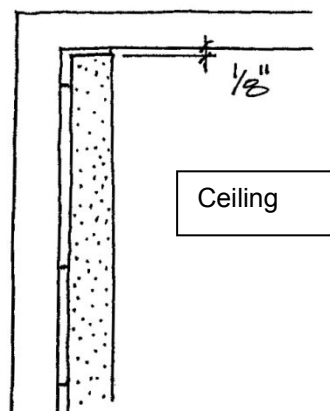
- Ensure that the walls that the panels are to be attached to are clean, smooth, plumb, and free of moisture. Do not attach HI-MACS to a wall that has damage caused by moisture.
- Cut panes to size using a router. Scribe to wall where necessary.
- Allow $\frac{1}{4}$ " gap at inside corners from HI-MACS sheet to wall surface. Allow $\frac{1}{8}$ " minimum gap from HI-MACS sheet to adjacent HI-MACS sheet.
- Provide a minimum of $\frac{1}{8}$ " expansion space (to be caulked with 100% silicone) at bottom of panel and interface of tub or shower pan.
- Provide a minimum of $\frac{1}{8}$ " expansion space at top of panel / ceiling interface.

- Cut all holes for faucets and plumbing using a router. Maintain at least $\frac{1}{2}$ " clearance around all items penetrating the wall panel.
- Attach the HI-MACS wall panel using 1" dia. spots or 2" circles of 100% clear silicone caulk, approximately 4" to 6" apart in all directions. Also apply a continuous bead of silicone at the perimeter and the edge of all cutouts.
- Press firmly into place and secure while silicone caulk sets. Hot melt glue can be used to aid this process, however because it sets rapidly, do not apply prior to placing the panel on the wall.
- Repeat this process for additional wall panels.
- Do not use a dark color of caulk on light colored panels. This could be visible as there is some translucence to certain HI-MACS colors.
- When finished, caulk all perimeter panels (including inside corners) with 100% silicone.
- Add corner trim, batten strips, etc., using color matched silicone caulk.



100% silicone caulk applied to the back of a HI-MACS wall panel

15.2. Wall and Wainscot



- Ensure that the walls that the panels are to be attached to are clean, smooth, plumb, and free of defects or damage. Do not attach HI-MACS to a wall that has moisture or damage caused by moisture.
- Cut panes to size using a router. Scribe to wall where necessary.
- Allow $\frac{1}{4}$ " gap at inside corners from HI-MACS sheet to wall surface. Allow $\frac{1}{8}$ " minimum gap from HI-MACS sheet to adjacent HI-MACS sheet.

- Provide a minimum of 1/8" expansion space (to be caulked with 100% silicone) at bottom of panel.
- Provide a minimum of 1/8" expansion space at top of panel / ceiling interface.
- For wainscot, leave a gap of 1/8" between the HI-MACS panel and any chair rail or transition material.
- Make cutouts for electrical outlets, etc. using a router. Maintain at least 1/2" clearance around all items penetrating the wall panel.
- Attach the HI-MACS wall panel using 1" dia. spots or 2" circles of 100% clear silicone caulk, approximately 4" to 6" apart in all directions. Also apply a continuous bead of silicone at the perimeter and the edge of all cutouts.
- Press firmly into place and secure while silicone caulk sets. Hot melt glue can be used to aid this process, however because it sets rapidly, do not apply prior to placing the panel on the wall.
- Repeat this process for additional wall panels.
- Do not use a dark color of caulk on light colored panels. This could be visible as there is some translucence to certain HI-MACS colors.
- Panels can be seamed together using seam adhesive. Do not attempt to adhesive seam wall panels while on the wall. All seams should be made horizontally on a flat surface, and sanded prior to placement on the wall. Refer to section 8 SEAMING for additional information. Alternately, panels can be seamed in place (on the wall) by using color matched silicone caulk.
- When finished, caulk all perimeter panels (including inside corners) with 100% silicone.
- Add corner trim, batten strips, etc., using color matched silicone caulk.

NOTE:

Saunas and steam rooms (including steam showers) are not approved applications for HI-MACS sheets to be used. HI-MACS Sheets used in these applications will crack. The LG Hausys warranty does not cover these applications.

16. TRANSPORTATION and INSTALLATION

HI-MACS countertops and other materials should be fabricated in the shop to the greatest extent possible, however components should not be so large as to be a burden in transport and handling.

Substructure, reinforcements, supports, backsplashes and field seams are all items either installed or finished at the jobsite. Before leaving the fabrication shop, carefully clean the fabricated materials and remove as much of the dust as possible. Cover or protect all finished components during transport.

16.1. Tools and Equipment

There is a variety of tools that can be utilized for installation of HI-MACS and ultimately, the selection is one of personal preference. The following list includes most basic tools but this list is not meant to be all inclusive.

- Hole saw
- A variety of clamps
- Variable speed polisher with buffing pads (stop to 3000 RPM)
- Hot glue gun
- Bulk adhesive gun
- Caulking gun
- 3 HP and 1 ½ HP Routers
- Orbital and belt sanders
- Electric drill
- Electric brad nailer
- Electric saw
- Good metal straight edges, 4' (1.2m), 8' (2.4m), 12' (3.7m) and inside corner Radius edge
- Squares and levels
- Tape measures
- Templates and guides
- Sanding blocks, both right angle and straight
- Screwdrivers and pliers/channel locks
- Shop vacuum broom and dust pan
- Extension cords
- Disposable dust masks and gloves
- Heat tape and packing tape
- Denatured alcohol
- White cotton or terry cloth rags
- Safety goggles or glasses and ear protection
- Scotch Brite pads
- Silicone caulking

Suggested Substructure Materials:

- 1" Square steel tubing
- 1/2" and 3/4" moisture resistant plywood or 3" and 4" solid hardwood
- LG HI-MACS Solid Surfacing reinforcing seam strips/blocks

16.2. Loading and Delivery

Vehicles used for transportation should not only be adequately outfitted for safely hauling material, they are a reflection on your business and your company. Keep them neat, clean, and well maintained.

- Review all job paperwork prior to loading to determine the scope of the installation. Inspect all HI-MACS pieces to check for finish, color match, edges, etc.
- Wear closed-toed shoes or boots when loading. LG HI-MACS sheets are heavy and even more so when fabricated into a monolithic countertop for installation.
- When handling sheets, workers should use leather work gloves to reduce the wear and tear on your hands. The edges of the LG HI-MACS sheets can be sharp. Always work safely.
- Transport large components vertically or on “A” frames. Use carpet or padding to protect the finished edges. Tie down and secure all components during transport.
- Do not try to load or unload the materials by yourself.
- Always plan for adequate manpower for handling and lifting at the jobsite.
- Brace all cutouts during transit.
- Be on time. Call the customer if you are running late.
- Allow the materials to reach room temperature before fabricating and installing. You should allow up to 2 hours if temperature differential is dramatic. During this time the materials will expand or contract depending on the circumstances.
- Seam materials work best in a temperature range of 60 degrees F (15 C) to 90 degrees F (32 C).

16.3. Support

- As previously mentioned in this manual, do not to apply solid substrates, especially around heat generating appliances in the installation. Wood and related wood products do not conduct or dissipate heat produced by heat generating appliances.
- Substrate materials to avoid Particle Board, OSB, ETC.
- If the cabinet has full dust covers, it is recommended to remove at least one half of the cover prior to top installation.
- You can use a full substrate with approved wood or wood product materials on furniture, table tops or related service counters, provided that no heat generation is present to accentuate the expansion and contraction properties of the top.
- Remember that the cabinets must be leveled and shimmed where necessary to 1/16” tolerances prior to countertop final installation.
- Apply perimeter support strips to the cabinet surfaces. You will need to install center support stringer materials across the cabinets for support. These support strips can be nailed with a finish nail or screwed into place provided the head is below the surface of the wood support that will come in contact with the HI-MACS countertop deck.
- Place stringer/support strips 12” apart.
- After the support system is installed and leveled, you will be ready to begin installation of the HI-MACS top.

16.4. Field Seams

Please note that all of the items in chapter 8 about seams and seam placement also apply to field seams. Refer to chapter 8 SEAMING for additional details and instructions.

- HI-MACS tops and components should be seamed in the fabrication shop to the greatest extent possible. Field seams should be made to reduce handling and provide for ease of installation.
- Keep seams 3-4 inches from inside or outside corners.
- Leave 3-4 inches between the seams and sink or countertop cutouts. Do not place a seam above the dishwasher.
- Make sure to clean the joining edges with denatured alcohol and a clean white rag.
- Create sharp, accurate seams and tight glue lines. Do not construct the seam too tight. You want to ensure the adhesive is not all squeezed out.
- Apply seam adhesive evenly and thoroughly so that all seaming surface areas are properly covered.
- Allow the seam adhesive to completely cure before finish sanding.

16.5. Tolerances

Install countertops to fit as closely as possible to adjacent finishes.

Fabrication and installation tolerances, if not specified elsewhere in this manual, should comply with the following;

- Provide a 1/16" minimum expansion gap at the interface of all walls, cabinets, or dissimilar materials. Maximum gap for expansion should be 1/8". Scribe countertops to the wall to achieve this tolerance. Caulk all gaps with 100% silicone sealant.
- Seams should be inconspicuous. They should not be visible from a distance of 6' away.
- Tops should be installed level. Maximum variation should be +/- 1/16" in 6'. Note: If cabinets are not level (+/- 1/16") have this corrected prior to installation of HI-MACS top.
- As long as base cabinets are in a straight plane, standard overhangs (front edge) should vary no more than 1/4" in 8'. Non-standard overhangs (over 2") should comply with the chart in Chapter 12.2.

16.6. Caulking

Caulk all HI-MACS countertops to non HI-MACS material using 100% Silicone sealant.

- Provide a 1/16" to 1/8" expansion gap at the interface of all walls, cabinets, or dissimilar materials. These expansion gaps should be caulked.
- Caulk loose HI-MACS backsplash to the countertop using a color matched silicone caulk. Make sure to caulk behind faucets. Smooth or "rake" the caulk joint to remove excess sealant and provide a finished appearance.
- Backsplash should be caulked to the wall. Gaps at this interface have the potential to exceed the maximum allowable due to variations in the wall surface.

16.7. Completion

Fabricators that pay close attention to details and quality throughout the fabrication process will ensure their customer's satisfaction and minimize costly call backs while at the same time maximizing the relationship for future work and/or referrals from the customer.

Establish a procedure of good will after the job is completed by providing them with the following information and reassurances;

- Inspect the entire job upon completion with customer. Review any quality check list you may have The customer will get a chance to appreciate the craftsmanship and care you put into their top.
- Review care, maintenance, and longevity procedures with the customer.
- Review maintenance procedures and your recommendations for the finish they have chosen.
- Describe the dangers of placing hot pots, pans, etc on the countertop. Also, review the negative effects of heat generating issues in sinks dishwashers and countertops.
- Leave color-matched materials in a trivet or cutting board or fixed color match materials below the sink on the cabinet wall and stress their importance for future repairs.
- Contact the customer after a month or two to see if they have any questions or concerns.
- Provide your company sticker or label to the inside cabinet door or inside cabinet wall below the sink for future maintenance or top refinishing or questions relating to their top. This is helpful especially after the original customer has moved.
- Thank the customer for their business.

The impression you leave on your customers is a reflection of LG Hausys. Your professionalism will help us to attain the highest level of customer satisfaction, which will benefit your company as well as ours.

17. TECHNICAL DATA

17.1. Specifications

Product Features

- Available in a wide spectrum of standard colors and patterns, as well as Custom Colors
- Ease of fabrication due to double-sided sanding of the top and bottom of every sheet to ensure premium quality and consistency
- Non-porous surface
- No grout lines, installation appears to be seamless

Specification

HI-MACS Acrylic Solid Surface is a product of LG Hausys.

HI-MACS is produced in Korea and in our state-of-the-art manufacturing plant in Adairsville, GA using a single-belt, continuous-cast line. The product is then shipped from the factory to domestic warehouses where it is distributed to retailers, fabricators, and customers on demand.

Solid surface materials combine two ingredients: a natural mineral (the “filler”) and a resin (the “binder”), along with various additives. Alumina trihydrate, or “ATH”, is the filler of choice in most solid surfaces including HI-MACS. ATH is refined from bauxite ore through the Bayer process. ATH is what gives solid surface its chemical, stain and water resistance. ATH also lends the product its Class A Fire Rating. Two main families of resins are used to make solid surface: acrylic and polyester. HI-MACS solid surface is made from acrylic-based resin, Methyl methacrylate or “MMA”. The acrylic-based resin in HI MACS yields a sheet that is thermoformable, which can be heated, bent to a new shape, and cooled without any loss of its performance characteristics.

HI-MACS is manufactured by combining the ATH filler and MMA acrylic resin with additives and particulates, pouring the mixture into a mold, and curing the resulting sheet. Curing is a critical part of the manufacturing process because it allows the chemical reactions time to complete leaving a stable, inert material with all its performance properties intact.

Standard Sheet Thicknesses: 1/4” (6mm nominal), 1/2” (13mm nominal)

Sheet Dimensions: 1/4” (6mm nominal)
30” x 98” (762mm x 2,489mm)

Sheet Dimensions: 1/2” (13mm nominal)
30” x 145” (762mm x 3,683mm)

Food Service

HI-MACS is ideal in the food service industry. Countertops, table surfaces, work stations and restrooms need to take the traffic and abuse that servers, kitchen staff, and customers parcel out on a busy day. HI-MACS gives restaurants, bars, buffets, and cafeterias the durability and the resistance to stains and bacteria needed in the food service industry. HI-MACS products have passed all NSF testing allowing its use with all food types.

Restaurant

HI-MACS is not only functional; it is also elegant. When patrons sit down for a nice dinner together, atmosphere and ambiance are everything. The details matter. Whether it is the touch and feel of the bar tops and table tops or the appearance of the restroom vanities and bowls, the little things are what make an impression. These features combine to make HI-MACS the ideal surface for all types of restaurants. Because of the elegant appearance of LG HI-MACS, along with its stain resistance and durability, it becomes a perfect match for any restaurant. And HI-MACS is renewable, meaning the appearance will retain its beauty and functionality as long as necessary – no matter who is cooking in the kitchen.

Lodging

In the lodging industry, a room becomes a guest's home away from home. Impressions matter. After a few days of living in their rooms, hotel guests begin to notice everything- from the grout in their showers to the torn laminate on the nightstand. HI-MACS is a perfect surface for hotel suites and rooms, superior to laminate for its ability to portray elegance (without the cost) while maintaining the long-term durability necessary for this kind of heavy traffic area. HI-MACS has been used for everything from sink bowls and vanity tops, to shower and bath surrounds, to windowsills, to nightstand counter tops, to the trim on doors. The thermoformability of HI-MACS gives added design freedom for ADA compliance in specially equipped bathrooms that provide ample mobility and aid to the handicapped guests. HI-MACS is not just for use in hotel rooms, reception counters, hotel restaurants and bars; entertainment and recreation areas can all benefit from the durability, elegance, and design flexibility of LG HI-MACS.

Healthcare

Because HI-MACS is resistant to stains, bacteria, and chemical spills, it is ideal for use in healthcare settings. It is inviting to the touch, elegant and beautiful, as well as fully capable of handling the requirements of a bacteria-intensive and chemical-rich environment. HI-MACS has been used in patient and public restroom vanities and bowls, patient bath and shower surrounds, laboratory sinks and work surfaces, cafeteria counters and tables, operating room walls, nurse's stations and transaction counters. Anywhere sanitary codes are an issue, HI-MACS is a valuable product because of its ability to combine safety with an aesthetically pleasing design. HI-MACS also has incredible design flexibility because of its thermoformability. Designers and architects have the freedom to design with ADA-compliance in mind providing patients with ample mobility, aid and other necessary requirements.

Retail

HI-MACS is a unique alternative from other surfaces when consistency, durability, and elegance are the combination your retail client is looking for. The affordability of HI-MACS allows your client to incorporate an upgraded solid surface product into their branded appearance, combining beauty with functionality. HI-MACS is ideal for shop signage and wall cladding, cosmetic counters, displays, transaction counters, and any other place customers roam. With a color palette that is professionally designed and maintained, the availability of 1/4" and 1/2" thicknesses allow coordinated designs to flow seamlessly through the environment. LG HI-MACS' "Custom Color" program offers a unique opportunity in your design. HI-MACS works well for high traffic areas that require a counter to be both durable and beautiful.

Commercial

Libraries, airports, museums, aquariums and other busy places need surfaces that are long lasting and can handle heavy traffic. HI-MACS is, by design, a highly durable surface, made especially for heavy traffic areas. As an acrylic solid surface, it is impact and scratch resistant and requires very little maintenance over the course of its lifetime. Unlike other solid surface products, HI-MACS offers customers a 15 year commercial limited warranty – a vital guarantee for any application that aims for permanence. LG HI-MACS' durability and renewability makes it an ideal surface for transaction areas and public restrooms. HI-MACS can be fabricated to fit most any custom built work area, such as teller lines, transaction counters, restroom partitions and stalls, and entertainment applications. Unlike other materials, its durability is exceeded only by its elegant beauty. HI-MACS versatile color palette is available in either 1/4" or 1/2" thicknesses, allowing the seamless flow of your design. HI-MACS offers you a unique opportunity to enhance and individualize your creative work with its "Custom Color" program.

Education

HI-MACS is engineered to withstand the wear and tear of an active student lifestyle. Each semester, year in and year out, the school's facilities appear brand new. Given the need for schools and their various accompanying facilities to be long-lasting while minimizing lifetime costs, it's necessary to go with a material that is durable, aesthetically pleasing and cost-effective. HI-MACS is ideal for these types of environments – for use in shower stalls, dormitories, laboratories, public restrooms, sinks and bowls, and even areas of prestige like the dean's office

Military

Military housing units see a lot of turn-over in any given year, these installations need to be durable and easy to care for. Our military personnel deserve a place that looks and feels like home – a place to live that will make their time at the base enjoyable and pleasant. HI-MACS appearance and versatility make it an ideal choice for military housing, barracks, showers and wall surrounds as well as for other types of government applications. It is durable and resistant to scratching and staining. An HI-MACS surface is easily renewable with little maintenance over its lifetime. A solid surface countertop speaks of permanence. Expect residents to feel at home in a kitchen covered with beautiful and durable HI-MACS surfaces. Applications in the past have included vanity tops and bowls, showers and wall surrounds, kitchen countertop and windowsills. Also, "Buy American" lists Korea as an approved material supplier for Government installations.

Vertical – Wet Wall

HI-MACS is a perfect solution for bathtubs or showers whether it is in a commercial or residential setting. HI-MACS extensive color line offers solid surface in both 1/4" and 1/2" thicknesses that fit in any bathroom design. And, because HI-MACS is thermoformable, the designs for showers and bathtubs can fit ADA mandated requirements for added mobility and aid. HI-MACS non-porous, seamless surface is easy to clean and durable. HI-MACS is functionality and beauty combined in a very affordable package.

- Residential Tub and Shower
- Hospital Bath
- Hotel Room Tub and Shower

Property	Result	Test
Consistency of Color (same sheet)	Pass	ISSFA SST 2.1-00
Cleanability Stain Rating	Pass	ISSFA SST 3.1-00
Visual Defects	Pass	ISSFA SST 5.1-00
Light Resistance	No Effect/Pass	ISSFA SST 7.1-00
Boiling Water Resistance	No Effect/Pass	ISSFA SST 8.1-00 re: NEMA LD3-3.5
High Temperature Resistance	No Effect/Pass	ISSFA SST 9.1-00 re: NEMA LD3-3.6
Flammability Rating	Class 1/Class A Approved for use in	ASTM E-84
Fungal/Bacterial Resistance	all food zones	ANSI/NSF Standard 51

Property	Unit	Result	Test
Density	lbs/in ³	0.06	ASTM D-792
Rockwell Hardness		90	ASTM D-785
Barcol Hardness		65	ASTM D-2583
Tensile Strength	psi	5,500	ASTM D-638
Tensile Modulus	psi	1.35 x 10 ⁶	ASTM D-638
Flexural Strength	psi	11,424	ASTM D-790
Flexural Modulus	psi	1.34 x 10 ⁶	ASTM D-790
Izod Impact Strength	ft.lbs/in	0.26	ASTM D-256
Water Absorption	% (1/2" sheet)	0.04	ASTM D-570
Heat Distortion Temperature	°F	220-230	ASTM D-648
Linear Thermal Expansion	in/in °F	2.12 x 10 ⁻⁵	ASTM E-228-95
Weatherability	1000 hr test	No change	ASTM D-1499
Radiant Heat Resistance	seconds	600+ (pass)	NEMA LD3-3.10
Impact Resistance	in.	60 (pass)	ISSFA SST 6.1-00
Flatness of Sheets	in.	Thickness=0.46450 (pass) Length: <0.010 Width: <0.020	ISSFA SST 4.1-00

17.2. Technical and Test Data

<Chemical Resistance>

Conc Hydrochloric acid	No Effect
Hydrochloric Acid (HCL) 20%	No Effect
Sulfuric Acid (H2SO4) 20%	No Effect
Ammonia (NH3) 28%	No Effect
Sodium Hydroxide (NaOH) 40%	No Effect
Methyl Alcohol	No Effect
Toluene	No Effect

Xylene (C8H10)	No Effect
Conc Nitric acid	Light marking with smooth surface
20%(v/v) Nitric acid	No Effect
60%(v/v) Perchloric acid	No Effect
85%(v/v) Phosphoric acid	No Effect
17%(v/v) Phosphoric acid	No Effect
30%(m/v) Potassium Hydroxide	No Effect
Acetone	No Effect
Bleach (NaOCl, Household)	No Effect
3%(v/v) Hydrogen Peroxide	No Effect
3.5% aq Iodine	No Effect
Bromine (Sat aq)	No Effect
5%(v/v) Silver Nitrate	No Effect
1%(v/v) Silver Nitrate	No Effect
Lead Acetate(Sat aq)	No Effect

Chemical Resistance after 24 hours

<Stain Resistance>

Milk, whiskey, distilled water, vegetable oil, citric acid(10%), lye, Ammonia, urine, iodine fluid(10%), vinegar, pine oil, ketchup, naphtha, hydrogen peroxide(3%), bleach, lipstick, trisodium phosphate(5%), isopropyl alcohol(90%).	Removed with water and household detergent
Crayon, #2 pencil, coffee, mustard, ethyl alcohol(90%)	Removed with cleanser
Permanent marker, black paste shoe polish, ball point pen, wet tea bag, acetone, fingernail polish remover	Removed with cleanser and Scotch Brite [®] pad

<Fire Rating : ASTM E84>

Class	Flame Spread	Smoke Developed
A	0-25	0-450
B	26-75	0-450
C	76-200	0-450

Test Result : Class A (Flame Spread – 20, Smoke Developed – 30)

17.3. MSDS

1) Chemical Product & Manufacturer's Information

a. Chemical Product Name

HI-MACS®

b. Usage

Countertops, other solid surface applications

c. Chemical Type

Acrylic Solid Surface

d. Manufacturer

900 Circle 75 Parkway, Suite 1500, Atlanta, GA 30339

e. In Case of Emergency

Tel: 866.544.4622

2) Ingredients

Name	CAS Number	% by Weight	TLV/PEL	LC50/LD50
Alumina trihydrate	21645-51-2	52-62	15mg/m3 OSHA PEL;10mg/m3 ACGIH TLV	Not available
Butyle Acrylate-methyl methacrylate	25852-37-3	30-50	Not available	Not available
Copolymer colorants	Not available	1-5	Not available	Not available

3) Health Hazard Data

The product is a solid sheet of varying color and, as such, has no health hazards associated with it.

However, dust generated from cutting, sanding, or routing may cause mechanical irritation to the skin, eyes and respiratory tract.

a. Eyes

Dust generated during fabrication may irritate eyes.

b. Skin

Any sharp edges will cut or abrade the skin. Dust generated by fabrication may cause skin sensitization.

(Methyl Methacrylate has been shown to cause allergic responses at high concentrations.)

c. Respiratory Tract

Dust generated during fabrication may cause irritation to respiratory tract, characterized by sneezing and coughing.

May cause headache in case of long term exposure.

4) First Aid Measures

a. Eye contact

Upon contact with nuisance dust particles, flush eyes immediately with large amounts of water for a minimum of 15 minutes. Seek medical attention.

b. Skin Contact

Not expected to be a problem. May cause skin sensitization.

Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap.

If irritation persists, seek medical attention.

c. Inhalation

Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Allow the victim to rest in a well ventilated area.

Oxygen may be administered if breathing is difficult. Seek medical attention.

d. Ingestion

Not applicable.

5) Fire and Explosion Data

a. Flammability

Non-flammable

b. Flash Point

Not available

c. Auto-Ignition Temperature

Not available

d. Products of Combustion

Some metallic oxides.

e. Fire Hazards in Presence of Various Substances

Non-flammable in presence of shocks, heat, oxidizing materials, reducing materials, combustible materials, organic materials, metals, acids, alkalis and moisture.

f. Explosion Hazards in Presence of Various Substances:

Not considered as a risk of explosion.

g. Fire Fighting Media

SMALL FIRE: use DRY chemicals, CO₂, water spray or foam

LARGE FIRE: use water spray, fog, or foam.

DO NOT use water jet.

6) Spill Procedures & Waste Disposal

a. Small Spill

Use appropriate tools to put the spilled solid in a convenient waste disposal container.

b. Large Spill

No additional information

c. Waste Disposal

Use appropriate tools to put the spilled solid in a convenient waste disposal container.

7) Handling, Storage & Transport

a. Handling

Do not breathe dust. If user operations generate dust, use ventilation to keep airborne contaminants below the exposure limit.

b. Storage

No specific storage is required. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

c. DOT/TDG Classification

Not a DOT controlled material

8) Special Protection Information

a. Eye

Safety glasses

b. Hands

Gloves to protect against cuts and abrasions are highly recommended.

c. Respirator

Wear appropriate respirator when ventilation is inadequate (NIOSH approved) because of generated dust.

9) Physical & Chemical Properties

a. Appearance

Solid

b. Odor

Odorless

c. pH

Not applicable

d. Specific Gravity

1.75

e. Evaporation Rate

Not available

f. Vapor Pressure

Not available

g. Solubility in Water

Insoluble

h. Solubility in Solvents

Insoluble in methanol, diethyl ether, n-octanol, acetone

10) Stability & Reactivity Data

a. Stability

The product is stable

b. Chemical Instability/Materials to Avoid

Not considered to be reactive according to our database

c. Corrosivity

Not considered to be corrosive for metals and glass according to our database

d. Hazardous Decomposition

Not available

e. Hazardous Polymerization

Yes

11) Potential Chronic Health Effects

The product is NOT toxic to blood, kidneys, lungs, the nervous system, the reproductive system, liver, or mucous membranes.

a. Chronic Effects

Not available

b. Mutagenic Effects

Not available

c. Teratogenic Effects

Not available

12) Ecological Information

a. Ecotoxicity Not

Not available

b. BODS and COD

Not available

c. Toxicity of the Products of Biodegradation

Not available

13) Federal Regulations

a. TSCA (Toxic Substance Control Act)

All components of this product are listed on the TSCA inventory

b. HMIS (Hazardous Material Information System)

Health Hazard : 1

Fire Hazard : 0

Reactivity : 0

Personal Protection : A

c. National Fire Protection Association (USA)

Hazard Rating : 4 = Extreme, 3 = High,

2 = Moderate, 1 = Slight, 0 = Minimal (Insignificant)



14) Other Information

The data contained in this MSDS and recommendations presented herein are based upon information considered to be accurate, as of this date. However, LG Hausys makes no guarantee or warranty, either expressed or implied, of the completeness of this data and recommendations, and assumes no liability in connection with any use of this information.

17.4. Certifications



SCS does hereby certify that an independent assessment has been conducted on behalf of:

LG Hausys America, Inc.

310 LG Drive SE, P.O. Box 569, Adairville, GA, USA

For the following product(s):

LG Eden Collection:

Cocoa, Honeysuckle, Ivy, Lemongrass, and Ripe Cotton

This product meets all of the necessary qualifications to be certified for the following claim:

Minimum 10% Pre-consumer Recycled Resin Content

Conforms to the SCS Recycled Content Standard V4-1

Registration # SCS-MC-01491

Valid from: February 1, 2012 to January 31, 2013



Robert J. Hrubes
Robert J. Hrubes, Ph.D., Senior Vice President
Scientific Certification Systems
2000 Powell Street, Suite 600, Emeryville, CA 94608 USA

SCIENTIFIC CERTIFICATION SYSTEMS

SCS does hereby certify that an independent assessment has been conducted on behalf of:

LG Hausys America, Inc.

LGCM, 310 LG Drive SE, P.O. Box 569, Adairsville, GA, USA

For the following product(s):

LG Eden Collection:

Pure Snow, and Pure Frost

This product meets all of the necessary qualifications to be certified for the following claim:

Minimum 20% Pre-consumer Recycled Resin Content

Conforms to the SCS Recycled Content Standard V4-1

Registration # SCS-MC-02581

Valid from: February 1, 2012 to January 31, 2013



Pre-consumer
SCS CERTIFICATION SYSTEMS
SCS-MC-02581



Robert J. Hrubes, Ph.D., Senior Vice President
Scientific Certification Systems
2000 Powell Street, Suite 600, Emeryville, CA 94608 USA

SCIENTIFIC CERTIFICATION SYSTEMS

SCS does hereby certify that an independent assessment has been conducted on behalf of:

LG Hausys America, Inc.

310 LG Drive SE, P.O. Box 569, Adairsville, GA, USA

For the following product(s):

LG Eden Collection:

Sugar Maple, Poplar, Horse Chestnut, Walnut, Birch Bark, Pecan,
Hickory, and Mountain Ash

This product meets all of the necessary qualifications to be certified for the following claim:

Minimum 35% Pre-consumer Recycled Resin Content

Conforms to the SCS Recycled Content Standard V4-1

Registration # SCS-MC-02322

Valid from: February 1, 2012 to January 31, 2013



Pre-consumer
SCS CERTIFICATION SYSTEMS
SCS-MC-02322



Robert J. Hrubes, Ph.D., Senior Vice President
Scientific Certification Systems
2000 Powell Street, Suite 600, Emeryville, CA 94608 USA



Certificate of Compliance

Certification Details:

Certificate No: 4007-410

Status: Certified

Period: 08/2007 - 08/2012

Restrictions: with or without LG HI-MACS® joint adhesive

LG HI-MACS

LG Hausys America, Inc.

This product has been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products

Reference Standard: GGPS.001 GREENGUARD IAQ Standard for Building Materials, Finishes, and Furnishings

Product Type: Furniture Components/Materials, Seating, and Free Standing Furniture and Furnishing Units

Criteria	Allowable Limits
TVOC ¹	≤ 0.25 µg/m ³
Formaldehyde	≤ 0.025 ppm
Total Aldehydes ²	≤ 0.05 ppm
Individual VOCs ³	≤ 0.1 TLV
4-phenylcyclohexene	≤ 0.0033 µg/m ³
Listing of measured carcinogens and reproductive toxins as identified by California Proposition 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC) must be provided.	
Any pollutant regulated as a primary or secondary outdoor air pollutant must meet a concentration that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (U.S. EPA, code of Federal Regulations, Title 40, Part 50).	

See referenced standard for a complete technical explanation.

¹ Defined to be the total response of measured VOCs falling within the C₆-C₁₀ range, with responses calibrated to a toluene surrogate.

² Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde, 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), with each individually calibrated to a compound specific standard.

³ Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438). Seating complies with ANSI/BIFMA X7.1-2011, ANSI/BIFMA M7.1-2011, and ANSI/BIFMA e3-2010 Credit 7.6.1

GREENGUARD Certification affirms that products meet the criteria of the referenced standard and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. The testing does not evaluate emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical and particle emissions.

The GREENGUARD Environmental Institute (GEI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.



Certificate of Compliance

Certification Details:

Certificate No: 4007-420

Status: Certified

Period: 08/2007 - 08/2012

Restrictions: with or without LG HI-MACS® joint adhesive

LG HI-MACS

LG Hausys America, Inc.

This product has been certified according to the GREENGUARD Children & Schools Certification Program for Low Emitting Products

Reference Standard: GGPS.002 GREENGUARD Children & Schools® Standard

Product Type: All Products

Criteria	Allowable Limits
Individual VOCs ^{1,2}	≤ 1/100 TLV and ≤ 1/4 CA chronic REL (Office Seating ≤ 1/100 TLV and ≤ 1/4 CA CREL)
Formaldehyde	≤ 0.0135 ppm / 13.5 ppb (Office Seating ≤ 0.00675 ppm / 6.75 ppb)
TVOC ³	≤ 0.22 µg/m³
Total Aldehydes ⁴	≤ 0.043 ppm / 43 ppb
Total Phthalates ⁵	≤ 0.01 µg/m³
Total Particles ⁶	≤ 0.02 µg/m³

See referenced standard for a complete technical explanation.

¹ Any VOC not listed must produce an air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial work place criterion (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438) and no greater than 1/2 the CA Chronic Reference Exposure Level (CREL) http://www.oehha.ca.gov/air/chronic_rels/AIChrels.html - (CRELs) Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHA), December 2008).

² 1-Methyl-2-Pyrrolidinone must be ≤ 0.16 µg/m³ for Office Furniture or ≤ 0.080 µg/m³ for Office Seating.

³ Defined to be the total response of measured VOCs falling within the C₆-C₁₀ range, with responses calibrated to a toluene surrogate.

⁴ Defined to be the total response of a target list of aldehydes (2-butanal; acetaldehyde; benzaldehyde; 2,5-dimethylbenzaldehyde, 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), with each individually calibrated to a compound specific standard.

⁵ Total phthalates include dibutyl (DBP), diethylhexyl (DEHP), diethyl (DEP), butylbenzyl (BBP), di-octyl (DOP), and dimethyl (DMP) phthalates.

⁶ Particles are only applicable to fibrous, particle-releasing products with exposed surface area in air streams.

Seating, Workstations and Casework Systems complies with ANSI/BIFMA e3-2010 Credit 7.6.2.

Complies with California Department of Health Services' "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" Version 1.1 (CA section 01350)

GREENGUARD Certification affirms that products meet the criteria of the referenced standard and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. The testing does not evaluate emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical and particle emissions.

The GREENGUARD Environmental Institute (GEI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.

18. CARE & MAINTENANCE

HI-MACS Cleaning, Care & Repair

HI-MACS[®] solid surfaces are stain resistant, easy to clean and hygienic, ideal for kitchen countertops, vanity tops, and other surfaces subject to the hazards of moisture and heavy wear.

Even the most used areas won't succumb to coffee, ink, or other stains.

No special cleaning products are needed to keep HI-MACS[®] looking beautiful day in and day out.

While HI-MACS[®] is extremely tough and durable, like any other fine material it can be damaged if abused or mistreated.

Reviewing these care and cleaning instructions can assist you in understanding how easy it is to care for your new HI-MACS[®] surface and how you can prevent more severe damage that may require special repairs.

With a little knowledge, you can enjoy the elegance and beauty of HI-MACS[®] for years to come.

Normal Cleaning

HI-MACS[®] is non-porous, so it can be wiped clean with a damp cloth or sponge and mild detergents or general purpose cleaners such as Mr. Clean.

If you have a matte finish, abrasive cleaners like Ajax or comet may also be used.

Periodically it may also be helpful to go over the entire surface in a circular motion with an abrasive cleaner or wet Scotch Brite pad to maintain a uniform appearance.

Care

Do not place hot pans directly from the burner or oven on the HI-MACS[®] surface.

Even though HI-MACS[®] can withstand sustained temperatures up to 225 °F, prolonged or extreme heat could cause yellowing.

A trivet should always be used under heated appliances, such as crock pots, electric frying pans, etc. A chopping board should always be used when using knives or any sharp objects with higher hardness than HI-MACS[®] to prevent scratches on the surface.

Although minor cuts and scratches in HI-MACS[®] can be repaired, deep cuts will require the services of professional. Strong acids such as those found in drain, toilet bowl, and oven cleaners should be used cautiously around HI-MACS[®].

If these items are accidentally spilled, wipe them up at once. Some of these items, when left on the surface, may cause whitening, which can be difficult to remove.

Spills and Stains

While most everyday spills can be removed with the cleaning techniques listed, some troublesome spills and stains such as food dye, tea, and fruit drinks may require more aggressive cleaning. These items can be removed with full strength bleach followed by a general cleanser.

Bleach should only come in contact with the surface for two to five minutes. On a matte finish, if you prefer, you can scrub with an abrasive cleaner. Even nail polish can be removed from HI-MACS[®] with nail polish remover or an abrasive cleanser.

Cigarettes

While HI-MACS[®] will not burn, should a lighted cigarette accidentally come in contact with the surface, it could leave a nicotine stain or scorch mark. Either of these can be removed by cleaning with an abrasive cleanser or buffing in a circular motion with a Scotch Brite pad.

Repairing Scratches

For removing superficial scratches, rub in a circular motion with a wet # 7448 Scotch Brite buffing pad until the scratches are removed. Clean thoroughly with soap and water and let dry.

For added protection, or if any additional luster is desired, after the surface is dry apply a non-wax polish such as Hope's Countertop Polish for Solid Surface or Countertop Magic. Deep scratches or scratches on a high gloss finish should be removed by a professional fabricator.

Dark Colors

All dark colors of any solid surface material require more maintenance. Under ordinary use, darker colors will show dirt, dust, scratches, rubs, fingerprints and watermarks more readily than lighter colors and patterns. Naturally, these colors require more care to maintain their appearance. For this reason, we recommend periodic professional maintenance in order to renew surfaces to their original matte finish.

19. Warranty - HI-MACS®

HI-MACS sheets are backed by a 15 year warranty that covers all manufacturing defects.

1) Warranty

HI-MACS® Residential/Commercial 15-Year Warranty

Congratulations on your new purchase of LG Hausys® solid surface product. LG Hausys expressly warrants that it will repair or replace this product, free of charge, if it fails due to any manufacturing defect during the first 15 years (excludes the Expressions sink line which carries a 10 year warranty) after initial installation. If it is determined by LG Hausys or its authorized warranty service agent that a defect in the material exists within the fifteen year period, LG Hausys will, at its sole option, repair or replace the defective HI-MACS® materials in accordance with the following warranty provisions and exclusions.

This warranty applies to HI-MACS surfacing products installed after May 20, 2010.

2) Terms and Conditions

1. The 15 year limited warranty applies to HI-MACS® surfacing materials only ; and
2. The 15 year limited warranty applies to HI-MACS® surfacing materials that have been fabricated and installed in accordance with the Fabrication Guide Book for transportation, storage, handling, fabrication, and installation. Improper fabrication or installation is the responsibility of the fabricator/installer; and
3. This warranty applies to HI-MACS® surfacing materials that have been properly maintained in accordance with the Care & Maintenance Guidelines; and
4. This warranty applies to HI-MACS® surfacing materials that have been permanently installed and have not been moved from the original location.

3) Exclusions

This warranty shall not apply to :

1. Products and/or materials that have not been paid in full.
2. Issues or occurrences that are inherent characteristics of HI-MACS® surfacing, regardless of whether viewed as a defect by the purchaser.
3. Damage caused by faulty or improper fabrication and installation, including but not limited to, seams, seam performance, and caulking.
4. Damage caused by any instability or improper support occurring in the property in which the product has been installed, including but not limited to, shifting, settling, or movement of the substrate.
5. Damage caused to any materials that have been moved, removed or relocated from its original place of installation.
6. Damage caused by any form of abuse, accidents, or misuse, including but not limited to, scratches, burns, stains, or cracks.

7. Damage caused by exposure to heat, including but not limited to, white rings or marks, and cracking that occurs near a cook top that transmits heat through a cooking device that extends over or near the countertop for an extended period of time.
8. Damage or cracking caused by thermal shock.
9. Color variance or variations in color and/or pattern on repairs. Exact matching of color on repair work performed in conjunction with this warranty is not guaranteed.

LG Hausys is not responsible for damage or injury caused in whole or part by acts of God, job site conditions, architectural or engineering design, structural movement, acts of vandalism, or accidents.

This warranty is extended to the original purchaser and may be transferred or assigned. A purchase receipt or other acceptable proof purchase will be required before warranty service is rendered. If transferred, a new warranty registration must be submitted with proof of the original purchase. The new warranty will be valid for the remaining time since the original purchase.

No other express or implied warranties of merchantability or fitness for a particular purpose are made by this warranty except for those expressly provided herein. Under no circumstances shall LG Hausys 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.

This warranty entitles the purchaser to specific legal rights. Other rights may also be available, which may vary from state to state. Some states do not permit the exclusion or limitation of implied warranties or of incidental or consequential damages, so the above limitation or exclusion may not apply to you. To know what your legal rights are, consult your local or state consumer affairs office or your state's Attorney General.

To obtain service under this limited 15-year warranty, please contact the source from which you purchased your HI-MACS® product. You must permit your Certified Installer or LG Hausys authorized agents to inspect your HI-MACS® product, and you must reasonably cooperate with your installer and LG Hausys agents in the efforts to provide service in conjunction with this limited 15-year warranty. If the problem is not handled to your satisfaction, please contact our representative directly by writing or calling:

LG Hausys America Inc.
900 Circle 75 Pkwy, Suite 1500
Atlanta GA, 30339

www.lghausys.com

(866) 544-4622

Please include your name, address, a description of the problem, and the phrase "HI-MACS®, 15 year limited warranty" in all correspondence. We will respond to all inquires within 30 days.

20. FAQ's

Q. Can I place a hot pan/pot on my HI-MACS[®] surface?

A. Do not place hot pans/pots directly from the burner or oven onto your countertops. Prolonged or extreme heat can cause yellowing. Hot pads and trivets are recommended to protect the surface when using any high temperature electronic cookware.

Q. How much heat can HI-MACS[®] take?

A. Although HI-MACS[®] countertops can withstand temperatures of up to 225°F, prolonged or extreme heat can cause yellowing.

Q. Will my HI-MACS[®] have seams?

A. Like all solid surface products, placement of seams may be required at the discretion of the fabricator. If seams are necessary, solid surface seams will be inconspicuous (not invisible).

Q. Do dark colors show wear and tear?

A. All dark colors of any solid surface material, including HI-MACS[®], require more maintenance. Under ordinary use, darker colors will show dirt, dust, scratches, rubs, fingerprints and watermarks more readily than lighter colors or patterns. Naturally, these colors require more care to maintain their appearance.

Q. What if I damage my solid surface countertop?

A. HI-MACS[®] is repairable. No matter the nick, scratch, stain or crack, HI-MACS[®] can be restored to its original state by a certified professional.

Q. Can I use HI-MACS[®] as a cutting board?

A. No, it is not recommended. Although minor scratches can be easily removed, regular cutting on your countertop will necessitate more maintenance by the customer. A separate cutting board is recommended.

Q. Will anything stain my HI-MACS[®] countertop?

A. Due to unique technology, HI-MACS[®] withstands most everyday stains. HI-MACS[®] is also non-porous so it doesn't promote growth of mildew, mold or bacteria. Customers receive a Care and Maintenance sheet to show them how to care for their countertop.

Q. Is there any special care needed for HI-MACS[®]?

A. No. Due to its non-porous attribute, there is no wax or sealant required. Normal cleaning only requires a damp cloth and a mild cleanser. Avoid using strong acidic cleansers (like those designed for drains, toilets or ovens). Some of them can cause whitening, which can be difficult to remove.

Q. What does my 15-year fully transferable warranty cover?

A. HI-MACS[®] expressly warrants that it will repair or replace its product, free of charge, if it fails due to any manufacturing defect during the first 15 years after installation. HI-MACS[®] obligation is limited solely to the repair and/or replacement of the product including reasonable and necessary labor charges.

Q. What about environmental issues?

A. LG Hausys is committed to providing environmentally sensitive products that meet the demands of everyone from its employees to designers, installers and consumers. LG Hausys installed state-of-the-art, air quality control equipment when building its U.S. plant, so its air treatment programs exceed environmental minimums established by the EPA. Made from high quality acrylic ingredients, HI-MACS[®] is GREENGUARD Indoor Air Quality Certified[®] for low emissions, making it ideal for sensitive areas like kitchens, bathrooms, classrooms and laboratories. Additionally, it is renewable and can be recycled at the end of its life.

Q. What are vertical applications with HI-MACS®?

A. HI-MACS sheets can be vertically mounted using either horizontal or vertical seams. Wall cladding pieces can be seamed together or joined using 100% silicone sealant. Either ¼" or ½" sheet material may be used, however the ½" thick material will generally prove more durable.

For details, refer to Vertical Applications page.

Q. What is the impact strength and flexural strength of HI-MACS®?

A. The impact strength is determined by test number ASTM D-256, which measures Izod impact strength. This test measures how much force it takes to break the slab when the weight swings to the slab, like a pendulum. HI-MACS® withstands the force up to 0.26 ft.lbs/in.

The flexural strength measures the amount of force product can withstand by slightly bending before breaking.

This is measured by test number ASTM D-790, and the force is measured at 11,424 psi.

Q. What is the recommended temperature for thermoforming HI-MACS®?

A. Refer to the table below.

Thickness of HI-MACS	¼"	½"
Oven temperature (°F)	320~374	320~374
Heating Time (Minutes)	20	40
Minimum Curve Radius (inch)	R=2"	R=3"
Cooling Time (Minutes)	10~20	20~40