

MSDS (Material Safety Data Sheet) – Feb 16, 2010-R01 LG HI-MACS® (Acrylic Solid Surface)

The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

1. Product / Company Identification:

PRODUCT NAME: LG HI-MACS® Sheets (Acrylic Solid Surface Material)

COMPANY: LG Hausys America, Inc.
900 Circle 75 Parkway; Suite 1500
Atlanta, GA 30339PHONE NUMBERS:
Home Office: 678-486-8250
Product/Safety: 706-879-3200
Transport Emergency: 800-255-3924 (Chemtel)**2. Composition / Ingredient Information:**

"HI-MACS®" Solid Surface Material, CAS #: N/A 100%

*Material is not known to contain Toxic Chemicals under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40CFR, Part 372.

Exposure Limits may be applicable for the following: (During Machining)
(Also See Section 3, Hazard Identification)

Name / Component	CAS #	PERCENT (%)	OSHA PEL / ACGIH TLV	COMMENTS
ATH - Alumina Trihydrate (Aluminum Hydroxide)	21645-51-2	52 – 62	Not Available	-
PMMA (Polymethylmethacrylate)	9011-14-7	30 – 50	As Particulate, Dust 15 mg/m ³ / 10 mg/m ³ 5 mg/m ³ (Respirable Dust)	-
Copolymer Colorants	Not Available	1 – 5	Not Available	-
MMA – Methyl Methacrylate (As Vapor Only, During Machining)	80-62-6	<1	PEL: 475 mg/m ³ , (100 ppm)	High Heat Only

3. Hazards Identification:

"LG Hi-Macs" Solid Surface Material is not hazardous as shipped and will not easily enter the human body. However, operations such as sawing, routing, drilling and sanding can generate dust. High concentrations of dust can irritate eyes, nose and respiratory passages and cause coughing and sneezing. Even though there are no exposure limits established for dust from Hi-Macs®, avoid breathing dust. (See details in Section 8, Exposure Controls/Personal Protection Section). LG Hausys recommends using the exposure limits for *Particulates, Not Otherwise Regulated (PNOR)*, as listed for ATH and PMMA in the table in Section 2.

"LG Hi-Macs" Solid Surface Material does not off-gas at room temperature. At higher temperatures (>300°C / 572°F), small amounts of methyl methacrylate (MMA) could be released, amount dependent upon temperature, time and other variables. Vapors can irritate eyes, skin, nose and throat and can cause allergic skin rashes. Overexposure to vapors can cause headache, nausea, weakness and lung irritation with cough, discomfort and shortness of breath. Individuals with preexisting diseases of the lungs or skin may have increased susceptibility to the effects of overexposure to methyl methacrylate.

Carcinogenicity: None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen

4. First Aid Measures:

INHALATION:

No specific intervention is indicated as material or sheets are not likely to be hazardous by inhalation. However, during machining, if large amounts of dust are inhaled or exposed to fumes from overheating or combustion, remove to fresh air. Consult a physician if breathing is difficult or if symptoms persist.

SKIN CONTACT:

Contact with skin is not likely to be hazardous; but, cleansing skin after machining is recommended. If skin irritation/sensitization does occur, gently wash area with running water and non-abrasive soap. If irritation persists, seek medical attention.

EYE CONTACT:

In case of contact with dust or fragments, immediately flush eyes with plenty of water for at least 15 minutes. Contact a physician if irritation or pain develops.

INGESTION:

No intervention is indicated, not likely to be hazardous by ingestion. Consult a physician if necessary.

5. Fire Fighting Measures: (Fire and Explosion Data)

Flammable Properties: Non-Flammable. Can only be combusted with difficulty.

Flash Points: Not Applicable (N/A) Auto-Ignition Temperature: N/A

Fire/Decompositions Products: Hazardous gases/vapors produced in a fire are carbon monoxide, hydrocarbons, aldehydes, methyl methacrylate, and smoke.

Extinguishing Media: Water, Dry Chemical/Powder, Carbon Dioxide-CO₂, Foam.

Fire Fighting Instructions: In case of fire, keep personnel removed and upwind. Responders should wear self-contained breathing apparatus.

Explosion Hazards: Not considered a product with explosion risks.

6. Accidental Release Measures:

Dust / Debris: Review HANDLING Section before proceeding with clean-up. Use appropriate tools to put spilled solids in a convenient waste disposal container.

Fire Situation: Review FIRE FIGHTING MEASURES and HANDLING Sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT and recover undamaged and minimally contaminated material for reuse and reclamation.

7. Handling and Storage:

HANDLING: (Unloading / Moving)

Sheets should be unloaded with a forklift or other lifting device capable of handling pallets safely. If a lifting device is not available, always carry a single sheet in the vertical position and wear proper safety shoes and protective gloves as sheets may have sharp edges. Carrying should be done by two people facing each other on short sides with one hand under the bottom edge for support and the other hand on the top edge to control the sheet.

HANDLING: (Machining)

Avoid breathing dust. Avoid breathing fumes generated during heating. Temperatures reached while thermoforming could be high enough to release some methyl methacrylate. Machining operations during fabrication, such as sawing, sanding or routing, create friction and may result in temperatures high enough to release small amounts of methyl methacrylate at the cutting tool surface.

STORAGE:

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

8. Exposure Control / Personal Protection:

ENGINEERING CONTROLS:

Use adequate ventilation to keep employee exposures to airborne concentrations below recommended limits for dust or vapors from operations such as machining, cutting, routing, sanding, etc. In addition, provide for appropriate exhaust ventilation and dust collection at machinery.

PERSONAL PROTECTIVE EQUIPMENT:

EYE/FACE PROTECTION:

Wear safety glasses during operations such as sawing, sanding, drilling, or routing. Also, machining operations could require safety goggles and face-shield to protect against flying debris/particles.

PROTECTIVE CLOTHING:

Wear leather or cotton gloves when handling pieces to protect against cuts and abrasions. Safety shoes are also recommended whenever handling large pieces of material. Hearing protection may also be required during machining operations, depending on noise (decibel) levels.

RESPIRATORY PROTECTION:

In case of insufficient or inadequate ventilation during machining operations or if airborne particulate concentrations or vapors are expected to exceed permissible exposure limits, use a NIOSH approved air purifying respirator. Respirators should be selected based on the form and concentration of the air contaminant and in accordance with OSHA Respiratory Protection Standard(s).

Exposure Guidelines / Exposure Limits: See Section 2, Composition / Ingredient Information.

9. Physical and Chemical Properties:

Form:	Solid Sheet/Material	Volatiles:	0% @ Room Temperature
Color:	Varies	Odor:	None - Odorless
Solubility:	Insoluble in Water	pH:	Not Applicable
Specific Gravity :	1.7 - 1.8	Molecular Wt:	Not Applicable
Boiling Point:	Not Applicable	Melting Point:	Not Applicable
Vapor Density:	Not Applicable	Vapor Pressure:	Not Applicable
Flash Point:	Not Applicable	Ignition Temp:	Not Applicable

10. Stability and Reactivity:

Stability: Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials: None reasonably foreseeable, non-corrosive.

Decomposition: Frictional heat from machining that could reach or exceed a temperature of 300°C (572°F) could result in the release of a small amount of methyl methacrylate vapor. Decomposition products from fire situation includes: carbon monoxide, methyl methacrylate, and smoke.

Polymerization: Polymerization will not occur in solid state.

11. Toxicological Information:

Methyl methacrylate can be present on cutting tool face at a concentration exceeding 100 ppm, TLV. However, it dissipates to very low levels with good ventilation. (See Section 2, Table)

MMA: LD50 (oral/rat) = 7872 mg/kg; RTECS 47796 (Registry of Toxic Effects of Chemical Substances)

12. Ecological Information:

Aquatic Toxicity: No information available. Toxicity expected to be low, insoluble in water.

13. Disposal Considerations:

Preferred waste disposal options include recycling, landfill, or incineration, when in compliance with applicable Federal, State/Provincial, and Local regulations.

14. Transportation Information:

DOT (US-49CFR): Material is Not regulated/controlled.
TDG (Canada): Material is Not regulated/controlled.
IATA (Air Transport): Not regulated/controlled. (Hazard Class/Packing Group: Not Applicable)
IMDC (Ocean Transport): Not regulated/controlled. (Hazard Class/Packing Group: Not Applicable).

15. Regulatory Information:

U.S. Federal Regulations - TSCA Inventory Status:

In compliance with TSCA Inventory requirements for commercial purposes, all components listed.

State Regulations (U.S.):

PENNSYLVANIA HAZARDOUS SUBSTANCES LIST, PRESENT AT A CONCENTRATION OF 1 % OR MORE (0.01% FOR SPECIAL HAZARDOUS SUBSTANCES): None known.

WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM: None known.

NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST, PRESENT AT CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS): None known.

Canadian Regulations - WHMIS Classification:

Exempt / Manufactured article. DSL: Exempt / Article.

DSCL (ECC) (Europe): Not controlled under USCL (Europe)

16. Other Information / Classifications:

HMIS (US): Health: 1 Fire: 0 Physical: 0 Personal Protection: B
NFPA (US): Health: 2 Fire: 0 Reactivity: 0 Personal Protection: B
Hazard Ratings: 4 = Extreme, 3 = High, 2 = Moderate, 1 = Slight, 0 = Minimal (Insignificant)

Additional Information:

MEDICAL CAUTION: Do not use in applications involving permanent implantation in the human body.

Glossary:

ACGIH – American Conference of Governmental Industrial Hygienist
CAS – Chemical Abstract Services
CFR – Code of Federal Regulations
DOT – Department of Transportation
DSL – Domestic Substance List (Canada)
HMIS – Hazardous Material Identification System
IARC – International Agency for Research on Cancer
LD50/LC50 – Lethal Dose/Concentration, 50% Kill
NFPA – National Fire Protection Association
NIOSH – National Institute for Occupational Safety & Health
NTP – National Toxicology Program
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit (OSHA)
TDG – Transportation of Dangerous Goods (Canada)
TLV – Threshold Limit Value (ACGIH)
TSCA – Toxic Substances Control Act
WHMIS – Workplace Hazardous Material Information System

The information in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information is based upon technical information believed to be accurate and reliable and is subject to revision as additional knowledge and experience is gained.

MSDS Responsibility : LG Hausys America, Inc.; 310 LG Drive; Adairsville, GA 30103; 706-879-3200

FAI Materials Testing Laboratory, Inc.

825 Chance Road, Marietta, Georgia 30066 ▪ Ph 770-928-1930 ▪ Fax 770-928-9202 ▪ Info@FAI.US ▪ www.FAI.US

Coversheet

15 November 2012

Christopher Kim
Chemical Engineer
LG Hausys America
310 LG Drive
Adairsville, GA 30103

FAI Project: 1210044

FAI Quote: 2435

RE: Analysis of 4 Stains on White Tile by Colorimetry and Visual Inspection

Thank you for choosing FAI Materials Testing Laboratory for your chemical and materials testing needs. We are committed to providing you with the best customer service possible.

Timeliness and Satisfaction

Our goal is to complete your project within the approved time frame and budgets specified. In the event of unforeseen obstacles, we will strive to keep you fully informed of our progress and status. This is our commitment to each and every customer. It is for these reasons that your feedback pertaining to the quality, effectiveness, and timeliness of our performance will always be appreciated.

Guarantee of Quality

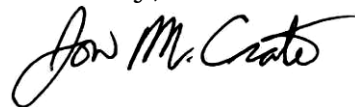
FAI Materials Testing Laboratory stands behind our test results to be accurate as reported. The test results apply to the samples received and may not be representative of the entire lot.

Sample Storage

Should the need arise for any further testing, FAI Materials Testing Laboratory commits to maintain possession of any residual samples for a period of three (3) months unless otherwise stated or requested, after which they will be discarded.

We thank you for this opportunity and look forward to working with you on future projects.

Sincerely,



Jon M. Crate, FAI President

FAI Materials Testing Laboratory, Inc.

825 Chance Road, Marietta, Georgia 30066 ▪ Ph 770-928-1930 ▪ Fax 770-928-9202 ▪ Info@FAI.US ▪ www.FAI.US

Testing Results and Analysis

Introduction

LG Hausys provided FAI Materials Testing Laboratory with pieces of white tile and requested an analysis of blood and 3M™ Duraprep™ Surgical Solution stains by colorimetric analysis and urine and Bouin's Solution stains by visual inspection.

Staining

Before applying the staining agents, the whiteness indices were determined in duplicate spots on the two tiles designated for the blood and the Duraprep™ stain while the two tiles designated for the urine and Bouin's Solution stain were visually inspected. Subsequently, the staining agents were applied to their designated tiles and set at ambient conditions for approximately sixteen hours.

Colorimetric Analysis

Each tile was rubbed with a moist and non-abrasive cloth until its stain no longer appeared to be removed by the cloth. Subsequently, a colorimeter was used to determine the whiteness indices of duplicate spots where the blood and Duraprep™ stains had been placed. Table 1 displays the whiteness index of each spot before and after the stain.

Table 1: Whiteness Indices of Tiles Before and After Staining

Tile Stain	Spot	WI Before Stain	WI After Stain
Blood	1	66.46	62.42
	2	65.84	62.67
DuraPrep™	1	66.46	-161
	2	66.12	-128

Visual Analysis

While the blood and urine stains were removed by the non-abrasive cloth the Duraprep™ and the Bouin's Solution stains remained. Next, the two remaining stains were subjected to scrubbing for approximately 40 seconds by an abrasive ScotchBrite™ scrub sponge with a bleaching cleaner. While the Duraprep™ stain appeared to be completely removed, the Bouin's Solution stain was only slightly removed, and each tile in its final condition is shown in Figure 1.



Figure 1: All 4 Stains after Final Scrubbing (Clockwise from Top-Left: Urine, Blood, Duraprep™, Bouin's Solution)

Please feel free to contact us with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bryan Shaw'.

Prepared by: Bryan Shaw, Quality Control

A handwritten signature in black ink, appearing to read 'Stuart McRae'.

Reviewed by: Stuart McRae, PE

Test Report



1325 North 108th E. Ave.
Tulsa, OK 74116
918.437.8333 ph. | 918.437.8487 fx.

CLIENT: LG Hausys American, Inc.
310 LG Drive
Adairsville, GA 30103

Attn: Christopher Kim

Test Report No: TJ0941-R1	Date: January 3, 2013
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SAMPLE ID: Fourteen (14) 12" x 12 tiles identified as: Arctic White, LG Hausys

SAMPLING DETAIL: Test samples were submitted to the laboratory directly by the client. No special sampling conditions or sample preparation were observed by QAI.

DATE OF RECEIPT: The samples were received in good condition at QAI on November 8, 2012.

TESTING PERIOD: November 12 – January 3, 2013

AUTHORIZATION: Signed QAI Proposal No.: FB110112-1 Rev. 1 by Chul Jung of LG Hausys American, Inc., dated November 5, 2012

TEST PROCEDURE: CSA B45.5/IAPMO ANSI Z124.11, *Plastic Plumbing Fixtures (Stain Resistance) and Client Protocol on assorted chemicals and stains.*

TEST RESULTS: Detailed test results are presented in the subsequent pages of this report.

Prepared By

**Signed for and on behalf of
QAI Laboratories, Inc.**

Linda Lewis
Materials Testing Technician

Randall P. Baker, PE
Plumbing and Materials Manager

**ANSI Z124.11 (All ratings below are described in Section 5.11.2)****5.11 Stain Resistance:****Pass**

Reagent	Exposure Time	Covered Specimen Rating	Uncovered Specimen Rating
Black Crayon	16 hrs.	1	1
Black Liquid Shoe Polish	16 hrs.	1	1
Blue Washable Ink	16 hrs.	1	1
Lipstick	16 hrs.	1	1
Hair Dye	16 hrs.	1	1
Iodine, 1%	16 hrs.	1	1
Gentian Violet Solution	16 hrs.	1	1
Beet Juice	16 hrs.	1	1
Grape Juice	16 hrs.	1	1
Wet Tea Bag	16 hrs.	1	1
Total Each Section		10	10
Total Stain Resistance Rating (64 max.):		20	

Client Requested Reagents**Pass**

	Reagent	Exposure Time	Covered Specimen Rating	Uncovered Specimen Rating
1	Acridine Orange	16 hrs.	2	1
2	AG Eosine Blue	16 hrs.	3	2
3	Amyl Acetate	16 hrs.	3	3
4	Amyl Alcohol	16 hrs.	3	2
5	Aromatic Ammonia	16 hrs.	1	1
6	B-4 Conditioner	16 hrs.	1	1
7	Benzalkonium Chloride	16 hrs.	1	1
8	Benzene	16 hrs.	1	1
9	"Benco Dental" Bite Registration, Accelerator and Base	16 hrs.	1	1
10	Butyl Alcohol	16 hrs.	2	2
11	Calcium Thiocyanate	16 hrs.	1	1
12	Carbon Disulphide	16 hrs.	1	2
13	Carbon Tetrachloride	16 hrs.	2	1
14	Caulk IRM (with or w/o ZnO)	16 hrs.	3	3
15	"Chloraseptic" (Phenol 1.5%)	16 hrs.	1	1
16	Crystal Violet	16 hrs.	2	2
17	Cupra Ammonia	16 hrs.	3	3
18	Debacterol	16 hrs.	1	1

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	Reagent	Exposure Time	Covered Specimen Rating	Uncovered Specimen Rating
19	Dimethyl Formamide	16 hrs.	1	1
20	Dimethylene Blue	16 hrs	2	1
21	"Dry Bond" Dental Adhesive	16 hrs.	1	1
22	Eosin Y	16 hrs.	3	3
23	"Cavitec" Equalizing Accelerator & Base	16 hrs.	3	3
24	Ethyl Acetate	16 hrs.	3	3
25	Ethyl Ether	16 hrs.	1	1
26	Eucalyptol	16 hrs.	1	1
27	"Eugenol" (with or w/o ZnO)	16 hrs.	1	1
28	Ferric Chloride	16 hrs.	1	1
29	"Fisher" Formaldehyde	16 hrs.	1	1
30	Food Colouring	16 hrs.	1	1
31	Formaldehyde	16 hrs.	1	1
***	Household Soaps		See Below	See Below
32	Dawn Dish Soap	16 hrs.	1	1
33	Arm & Hammer Laundry Soap	16 hrs.	1	1
34	Introfiant Arterial	16 hrs.	1	1
35	Kelviscera Cavity Fluid	16 hrs.	1	1
36	Kerosene	16 hrs.	1	1
37	Lemon Juice	16 hrs.	1	1
38	"Limelite" Intermediary Varnish	16 hrs	1	1
39	Liquid shoe polish, Brown	16 hrs.	1	1
40	"Lysol" Brand Cleaner	16 hrs.	1	1
41	Methyl Ethyl Ketone	16 hrs.	3	2
42	Methyl Orange	16 hrs.	3	3
43	Methyl Red (1%)	16 hrs.	1	2
44	Mineral Oil	16 hrs.	1	1
45	Monseil's Solution	16 hrs.	1	1
46	Nail Polish	16 hrs.	1	1
47	n-Hexane	16 hrs.	2	1
48	Permaglo Arterial Fluid	16 hrs.	1	1
49	Permaflow Preinjection Fluid	16 hrs.	1	1



	Reagent	Exposure Time	Covered Specimen Rating	Uncovered Specimen Rating
50	Peroxide	16 hrs.	1	1
51	Phenolphthalein (1%)	16 hrs.	1	3
52	Phosphorus Pentoxide	16 hrs.	3	1
53	Potassium Permanganate (2%)	16 hrs.	3	3
54	Procaine	16 hrs.	1	3
55	Restorative Anti-Dehydration	16 hrs.	1	1
56	Rhodamine WT Powder	16 hrs.	3	3
57	Saffron	16 hrs.	1	1
58	Silica Dental Cement (liquid) "Calbra"	16 hrs.	2	2
59	Silver Nitrate (10%)	16 hrs.	3	1
60	Sodium Bisulphate	16 hrs.	1	3
61	Sodium Hydroxide Flake	16 hrs.	3	1
62	Sodium Hypochlorite (5%)	16 hrs.	1	1
63	Sodium Sulphate	16 hrs.	1	1
64	Solitine Solvent	16 hrs.	1	1
65	Soy Sauce	16 hrs.	1	1
66	Sugar (sucrose)	16 hrs.	1	1
67	Tannic Acid	16 hrs.	1	1
68	Tetrahydrofuran	16 hrs.	3	1
69	"Thymol" in Alcohol	16 hrs.	1	3
70	Tincture of Iodine	16 hrs.	1	1
71	Tomato Sauce	16 hrs.	1	1
72	Trichloroethane	16 hrs.	1	1
73	Trypan Blue	16 hrs.	3	3
74	Uric Acid	16 hrs.	1	1
75	Wright's Stain	16 hrs.	3	1
76	Zinc Chloride	16 hrs.	1	1
77	Zinc Oxide (paste, ointment)	16 hrs.	1	1

END OF REPORT

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