TECHNICAL DATA SHEET

PROPERTIES	UNIT	RESULT	TEST STANDARD
Specifc Gravity	g/cm^3	1.8	
Tensile Strength	psi	5,400	ASTM D 638
Tensile Modulus	psi	$1.4x10^6$	ASTM D 638
Elongation	%min	0.42	ASTM D 638
Flexural Strength	psi	9,200	ASTM D 790
Flexural Modulus	psi	$1.38x10^5$	ASTM D 790
Hardness (Rockwell)		92	ASTM D 785
Thermal Expansion	mm/mc	$3.04x10^{-5}$	ASTM D 785
Gloss (60 Gardner)		5-20	ANSI Z124
Color Stability		No Change	NEMA LD3
Wear & Cleanability		Passes	NEMA LD3
Boiling Water Surface Resistance		No Change	NEMA LD3
High Temperature Resistance		No Change	NEMA LD3
Stain Resistance		Passes	NEMA LD3
Impact Resistance		No Fracture	NEMA LD3
IZOD Impact Strength	ft.lbs/in	0.28	ASTEM D256
Water Absorption Weight	% max	0.03	ASTEM D570
Fungi & Bacteria		No Attack	ASTEM Z124
Wetherability		No Change	ASTM D 1499
NSF 51	Listed	All Colors	NSF

FUNGAL RESISTANCE TEST

TEST METHOD:

ASTM G 21 (Determining Resistance of Synthetic Polymeric Material to Fungi)

- Test Organism

  Aspergillus Niger (ATCC 9642)
  Chaetomium Globosum (ATCC 6205)
  Penicillium Pinophilum (ATCC 11797)
  Gliocladium Virens (ATCC 9645)
  Aureobasidium Pullulans (ATCC 15233)

- Rating in Accordance to ASTM G 21

RATING	GROWTH RATIO
0	NONE (NO GROWTH)
1	TRACE OF GROWTH (LESS THAN 10%)
2	LIGHT GROWTH (10%-30%)
3	MEDIUM GROWTH (30% - 60%)
4	HEAVY GROWTH (60%-

TEST RESULT:

Zero traces of growth

CULTURE TIME	WEEK 1	WEEK 2	WEEK 3
Result	0	0	0

FLAMMABILITY

TEST METHOD:

ASTM Designation E 84-01 (Standard Method of Test for Surface Burning Characteristics of Building Materials)

The test procedure is comparable to UL 723, ANSI/NFPA No. 255, and UBC No. 8-1.

Sample Presentation:
- The sample materials were submitted in six pieces 24" wide by 48" long.

The test was conducted in three different thickness:
- (6 mm = 1/4")
- (9 mm = 3/8")
- (12 mm = 1/2")

Sample Conditioning:
- Prior to testing, the sample pieces were placed in the conditioning room (maintained at 73.4 +/- 5°F and relative humidity of 50 +/- 5%) for a period of no less than 28 days and no more than 33 days.

Rating (Building Codes Cited):
- National Fire Protection Association, ANSI/NFPA No. 101, "Life Safety Code"

- Uniform Building Code, Interior Finishes, Sections 801-807

NFPA	UBC	FLAME SPREAD	SMOKE DEVELOPMENT
CLASS A	CLASS 1	0-25	0-450
CLASS B	CLASS 2	25-72	0-450
CLASS C	CLASS 3	76-200	0-450

TEST RESULT:

Because of the possible variations in reproducibility, the results are adjusted to the nearest figure divisible by 5. In order to obtain the Flame Spread Classification, the Test Result should be compared to the NFPA Class and UBC Class listed on Page 44.

THICKNESS	FLAME SPREAD	SMOKE DENSITY	RATING
6MM(1/4")	CLASS 1	0-25	CLASS A / CLASS 1
9MM (3/8")	CLASS 2	25-72	CLASS A / CLASS 1
12MM (1/2")	CLASS 3	76-200	CLASS A / CLASS 1

REFERENCE TABLE:

ITEM	FLAME SPREAD	SMOKE DEVELOPMENT
GYPSUM	15	0
ACOUSTIC TILES	25	10
INTERIOR WALL COVERING	25	15
LAMINATES (PLASTIC)	70	35
FIBERGLASS REINFORCED PANELS	70	500+
HARDBOARD	150	400
WOOD PARTICLE BOARD	1155	200

CHEMICAL AND STAIN PERFORMANCE REPORT

TEST METHOD:

- The chemical and stain reagents were applied to the surface and exposed to the sample of Hanex Solid Surfaces for 16 hours.
- The stained samples were then cleaned with a household cleanser and wet scrubbing pads.
- The stained samples were covered with a glass plate for adequate coverage.

CLASSIFICATION	%	GRITTY CLEANER OR WATER	SCOTCH BRITE™ OR SAND PAPER
ACETIC ACID	5	✔	
ACETIC ACID	10	✔	
ACETIC ACID	90		✔
ACETIC ACID	98		✔
ACETONE		✔	
AQUA REGIA			✔
AMMONIA	10	✔	
AMMONIUM HYDROXIDE	5	✔	
AMMONIUM HYDROXIDE	28	✔	
BENZENE		✔	
CALCIUM THIOCYANATE	78	✔	
CHLORIC HYDROXIDE	20		✔
CHLOROFORM	100		✔
CITRIC ACID	10	✔	
DIMETHYL FORMAHIDE		✔	

CLASSIFICATION	%	GRITTY CLEANER OR WATER	SCOTCH BRITE™ OR SAND PAPER
ETHANOL	95	✔	
ETHYL ETHER		✔	
FORMIC ACID	88		✔
FORMALDAHYDE		✔	
FURFURAL			
GASOLINE		✔	
HYDROCHLORID ACID	10	✔	
HYDROCHLORIC ACID	20	✔	
HYDROCHLORIC ACID	37	✔	
ISOPROPYL ALCHOHOL		✔	
KEROSENE	20	✔	
METHYL ALCOHOL	5	✔	
METHYL ETHYL KETONE		✔	
MINERAL OIL		✔	
NITRIC ACID	10		✔
NITRIC ACID	30		✔
NITRIC ACID	40		✔
NITRIC ACID	70		✔
PHENOL	40		✔
PHENOL	85		✔
PHOSPHORIC ACID	25		✔
PHOSPHORIC ACID	85		✔
SILVER NITRATE	10	✔	
SODIUM HYDROXIDE	10	✔	
SODIUM HYDROXIDE	25	✔	
SODIUM HYDROXIDE	40	✔	

CLASSIFICATION	%	GRITTY CLEANER OR WATER	SCOTCH BRITE™ OR SAND PAPER
SODIUM HYPOCHLORITE		✔	
SODIUM SULPHATE		✔	
SULPHURIC ACID		✔	
SULPHURIC ACID		✔	
SULPHURIC ACID			✔
SULPHURIC ACID			✔
TOLUENE			✔
XYLENE		✔	
ZINC CHLORIDE		✔	

SUPPLEMENTARY NOTES:

- For exposures to chemicals other than above, it is recommended to test on a sample piece of Hanex Solid Surfaces to confirm suitability for application.
- Some chemical reagents may damage the surface more seriously and will require expert repair or replacement.
- Common domestic residues, such as the examples listed below, can be removed with water and household cleaners.

-Alcohol	-Cigarette Stain	-Cooking Oil	-Curry Powder
-Hair Dyes	-Lipsticks	-Mustard	-Pencil Lead
-Shoe Polish	-Sugar	-Tomato Sauce	-Wine
-Ink	-Coffee	-Crayon	-Make Up
-Juices	-Lotions	-Nail Polish	-Salt
-Soy Sauce	-Tea	-Vinegar	-Food Dyes

HIGH-TEMPERATURE RESISTANCE

TEST METHOD:

ANSI/NEMA LD 3-2000, Section 3.6

Sample Preparation:

- All samples were prepared by sanding the surface as in an actual installation.

  Step 1: Sanded with 100 micron grit, three passes over substrate

  Step 2: Sand with 60 micron grit, three passes over substrate

  Step 3: Sand with maroon Scotch Brite™ pad, 2 passes over substrate

  Step 4: Sand with gray Scotch Brite™ pad, 2 passes over substrate

Sample Conditioning:

- Prior to testing, the sample pieces were placed in the conditioning room (maintained at 74 +\- 5°F and relative humidity of 53%+\-5%) for a period no less than 48 hours.

Test Procedure:

- A heating vessel was filled 2/3 full of paraffin wax and heated to 365°F and then allowed to cool to 356°F. The vessel was then placed on the sample for 20 minutes, then removed. A visual examination was then performed 24 hours after the removal of the vessel. Viewing was performed at a distance of approximately 30" - 36" and an angle of approximately 45° to 75° from the table surface. The samples were rotated on the same plane and viewed from all directions.

TEST RESULT:

From four samples that were tested, three sample pieces had no effect (no change in color or surface finish). One sample did have a slight effect (change in color of surface finish that is only visible at certain angles of direction). Standard repair techniques were used to correct any discoloration.

*Scotch Brite™ is a trademark of 3M Company, USA

COLOR FASTNESS AND AGING

TEST METHOD:

ANSI/ICPA SS-12001, ASTM D 2565 and NEMA LD 3-2000

Sample Preparation:

- Three 2" x 5" along with one additional sample was retained for control sample.

- All samples were prepared by sanding the surface as in an actual installation.

  Step 1: Sanded with 100 micron grit, three passes over substrate

  Step 2: Sand with 60 micron grit, three passes over substrate

  Step 3: Sand with maroon Scotch Brite™ pad, 2 passes over substrate

  Step 4: Sand with gray Scotch Brite™ pad, 2 passes over substrate

Sample Conditioning:

- Prior to testing, the sample pieces were placed in the conditioning room (maintained at 74 +\- 5°F and relative humidity of 53%+\-5%) for a period no less than 48 hours.

Test Procedure:

- The samples were placed into a Xenon Arc test chamber for 200 hours. The black panel temperature was 145°F and the irradiance set to 0.35W/m2 @ 340nm. At the completion of the test, the control sample was visually compared to the tested samples and performed at a distance of approximately 30" - 36" and an angle of approximately 45° to 75° from the table surface. The samples were rotated on the same plane and viewed from all directions.

TEST RESULT:

From four samples that were tested, three sample pieces had no effect (no change in color or surface finish). One sample did have slight effect (change in color of surface finish that is only visible at certain angles of direction). Standard repair techniques were used to correct any discoloration.

*Scotch Brite™ is a trademark of 3M Company, USA

THERMOFORMING

Among the many benefits of Hanex Solid Surfaces over other surfacing materials, the ability to thermoform allows unlimited design possibilities. To achieve the proper result, right oven calibration, minimum radius and accurate mold preparation are important.

RECOMMENDED MINIMUM RADIUS DEPENDING ON THICKNESS AND COLOR GROUP:

SHEET THICKNESS	MAXIMUM INSIDE RADIUS	MATERIAL GRADE
1/4" Material	1" Radius	Solo, Duo
1/2" Material	3" Radius	Solo, Duo
1/2" Material	5" Radius	Trio
1/2" Material	7" Radius	Pallazzo

RECOMMENDED HEAT AND DURATION DEPENDING ON THICKNESS:

SHEET THICKNESS	OVEN TEMPERATURE	TIME
1/4" Material	150°C (302∞F)	30-60 min
	175°C (347∞F)	15-30 min
1/2" Material	150°C (302∞F)	45-80 min
	175°C (347∞F)	25-60 min

PRODUCT NAME

Hanex® Solid Surfaces
Hanex is a registered trademark of Hyundai L&C USA.

MANUFACTURER/SUPPLIER

Hyundai L&C
7-8F Center One Building,
26 Eulji-ro 5-gil, Jung-gu, Seoul, Korea
Tel: 080.729.8272
www.hyundailnc.com

CONTACT FOR PRODUCT INFORMATION OR EMERGENCY

Hanex Solid Surfaces
2839 Paces Ferry Rd, Suite 1100
Atlanta, GA 30339
Tel: 888.426.9421
Tel: 770.431.6110

COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CASE #	% BY WEIGHT
Polymethyl Methacrylate	8011-14-7	>30
Almina Trihydrate	21645-51-2	<70
Methyl Methacrylate (Degradation Product)	80-62-6 <1	<1

ACCIDENTAL RELEASE MEASURES

SAFEGUARD (PERSONNEL)

- Use appropriate personal protective during clean up.

**Note: Review Fire-Fighting Measures and Handling (Personnel) sections before proceeding with clean-up.*

SPILL CLEAN-UP

- Recover undamaged and minimally contaminated material for reuse and reclamation.

FIRE FIGHTING MEASURES AND EXPLOSION HAZARD

FLAMMABLE PROPERTIES

- Hanex Solid Surfaces can be combusted only with difficulty.
- Hazardous gases/vapor produced in fire are carbon monoxide, methyl methacrylate, aldehydes.

EXTINGUISHING MEDIA

- Water, Dry Chemical, CO_2

FIRE-FIGHTING INSTRUCTIONS

- Keep personnel removed and upwind of fire.
- Wear self-contained breathing apparatus.

HANDLING AND STORAGE

HANDLING (PERSONNEL)

- Avoid breathing dust.
- Avoid breathing fumes generated during sawing, routing or drilling.

HANDLING (PHYSICAL ASPECTS)

- Avoid dust generation.

STORAGE

- Store in a cool place.

EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING CONTROLS (VENTILATION)

- Use ventilation that is adequate to keep employee exposure to airborne concentration below exposure limits.

PERSONAL PROTECTION

- Protective equipment: Eye/Face protection
- Wear safety glasses during operations such as sawing, sanding, drilling or routing.

TOXICOLOGICAL INFORMATION

SKIN/EYE IRRITANT

Polymethyl Methacrylate

- The compound is not a skin or eye irritant and is not a skin sensitizer in animals. Single or repeated ingestion produced mild degenerative changes of liver and kidney.

Methyl Methacrylate

- The compound is a skin irritant, is a moderate eye irritant and is a skin sensitizer in animals.

Alumina Trihydratelate

- The compound is untested for skin and eye irritant and is untested for animal sensitization.

Acute Toxicity (LC50):

- Polymethyl Methacrylate:.....→2MG/1, 4hr LC50 (Inhalation/Rat)
- Methyl Methacrylate:.....7093PPM/4 hr LC50 (Inhalation/Rat)

Acute Toxicity (LD50):

- Polymethyl Methacrylate:.....→2000mg/kg, 4hr LD50 (Oral/Cat)
- Methyl Methacrylate:.....7900PPM/4 hr LD50 (Oral/Cat)

ECOLOGICAL INFORMATION

- Biodegradation: No information available
- Bioaccumulation: No information available
- Aquatic Toxicity: No information available

DISPOSAL CONSIDERATIONS

- Dispose in accordance with federal, state and local regulation.
- The owner of the material is responsible for proper waste disposal.

OTHER INFORMATION

- The data 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.

- Responsibility for MSDS: Hanex Solid Surfaces products.

- This information is based on technical information deemed reliable and is subject to revision as additional information is made available.

COMPONENTS MATERIAL

- Methyl Methacrylate (MMA)
- Polymethyl Methacrylate (PMMA)
- Unsaturated Polyseter Resin (UPR)
- Aluminum Trihydrate (AL-OH3)

Materials are not known to contain toxic materials under Title III and Reauthorization Act of 1986 and 40 CFR part 372.

HAZARDS IDENTIFICATION

- Xacrylon Solid Surface is not hazardous in its original state but fabricating procedures may generate dust at a high degree, which might result in release of MMA vapor that could cause irritation to the eye, nose and throat areas and skin rash. Inhalation of MMA vapor may cause nausea, shortness ofbreath, coughing, lung irritation, increased blood pressure and abnormal testing of kidney functions.

- Persons with lung disease may have adverse affects when exposed to dust of MMA.

- There are no known carcinogens in this material at levels in excess of 0.1%, as listed by OSHA or IARC.

FIRST AID MEASURES

- Inhalation: No specific action required. If any irritation occurs, consult a physician.

- Eye Contact: Flush eyes immediately with ample amounts of fresh water for at least 20 minutes.

- Ingestion: Although the material is unlikely to be hazardous after ingestion, consult a physician.

FIRE FIGHTING MEASURES

Pursuant to NEMA LD3, Xacrylon is highly resistant to flame, but if exposed to extremely high temperatures it may be combusted. Hazardous gases released in fire are methyl methacrylate, carbon monoxide and aldehydes. Agents for extinguishing are water, dry chemical and carbon dioxide. Instructions for fire-fighting are to keep personnel upwind and to wear self-contained breathing equipment.

STORAGE AND HANDLING

- Avoid breathing dust or creating dust.
- Work areas should be clean, dry and well ventilated.
- Work gloves, work shoes and protective eye goggles should be worn.
- A protective face dust mask should be used over nose and mouth when engaging power tools.
- Avoid breathing fumes as a result of fabrication.
- Store in a dry and cool place.

PHYSICAL AND CHEMICAL PROPERTIES

- 0% Volatiles
- Insoluble in water
- Form: Sheets
- Specific Gravity: 1.8 g/cm3

CHEMICAL STABILITY

- Stable at normal temperatures and storage.
- Decomposition at 572°F. Release of MMA.
- Will not polymerize.

WASTE DISPOSAL

- Incineration or use of landfill.

REGULATORY INFO

- No known substances to cause cancer, birth defects or other reproductive injury.