Lite-Crete

- **FOR USE ON PLYWOOD FLOORS**
- **DURABLE & PERMANENT**
- **FIRE RETARDENT & NON-COMBUSTIBLE**
- **EXCELLENT SUB-FLOOR SURFACE**
- **ECONOMICAL**

I.C.B.O 3404

Lite-Crete®

Lite Crete® Cellular Insulating Concrete

Is a superior new product designed to meet the requirements of today's progressive architects and builders.

Lite Crete® uses two basic components, sand and Portland cement, long used in construction for lasting strength and durability. By the use of Lite Crete foam injected into the cement and sand mix; a controlled density insulating concrete is formed with a minimum mass formed by non-interconnected air cells, which will resist water absorption and sound transmission.

Lite Crete® on floors replaces all other types of underlayments and does not follow the contours of uneven joists and sub-floors. The Cellular Concrete fill is floated and hand troweled to a smooth level, hard surface that assures an excellent base for any floor covering, carpet, vinyl, asphalt, tile, linoleum or parquet floor.

In an effort to provide a better environment and minimize tenant turnover and improve the quality of construction, the U.S. Government, State of California, many banks and other leading institutions in the private sector, are now very concerned about structural and airborne sound transmissions. Lite Crete's® designed density and cellular structure provide a material that effectively reduces normal and impact sound transmissions insuring premium performance at a minimum cost. The use of Lite Crete® is a proven way of providing Sound Isolation and insures the owner of the building a high rate of occupancy with a minimum of original cost and Maintenance.

Specifications for Lite Crete®
SOUND INSULATING CONCRETE ON PLYWOOD

PROPORTIONING: LITE-CRETE concrete shall be designed for proportioning to yield a wet density of 105 PCF with a concrete strength of 1200 minimum p.s.i. and shall be poured 1 ½ inches thick on a 20/20 Kraft or Equal membrane supported by plywood or sheathing.

MATERIALS: Cement shall by Type I Portland Cement meeting the requirements of ASTM Specifications C-150. Aggregate shall be sand meeting local specifications. Water shall be free of all matter harmful to concrete.

MIXING: LITE-CRETE concrete may be mixed in any conventional type of concrete, or transit mixer that will thoroughly blend all ingredients of the concrete, prior to adding the LITE-CRETE foam.

PLACING: LITE-CRETE concrete shall be pumped in place by a qualified and certified applicator.

FINISHING: LITE-CRETE concrete shall be finished, manually, as soon as possible after placing. Care should be exercised to avoid over-finishing.

CURING: LITE-CRETE concrete shall be protected from drying too rapidly or freezing, in accordance with recommended practices of PCA and ACI for ordinary concrete**.**

Sound Stop

I.C.B.O. #3404

Sound Stop® is the new Sound Barrier Concrete developed by Lite-Crete® for insulation in multi family housing. This new product eliminates the need for R-11 insulation batts between the floor joists and allows the use if a single plate in all wall constructions. The combined savings of no batts and a single plate plus assurances of tested and approved sound transmission qualities both STC and IIC makes Lite-Crete® Sound Stop® a superior product and the best value.

1. Scope

The cellular concrete applicator shall furnish all labor, materials, equipment, and supervision for installing the cellular concrete floor fill in accordance with the plans and specifications. The work covered in the specification shall be properly coordinated with the work of other trades.

2. Materials

a. Portland cement shall conform to ASTM C150 71 Type I, II, III or to ASTM C595-71 type IS. Regulated set Portland cement may be used subject to availability and recommendations of Lite Crete®, Inc.

b. Fine aggregate shall conform to the requirements of ASTM C33-71, C144-71, or C330-69.

c. Water shall be portable and free from deleterious amounts of acid, alkali, and organic materials that would affect the setting time or strength of the concrete.

d. Foaming agent shall be that manufactured by Lite Crete®, Inc and installed by applicators qualified and certified by Lite Crete®, Inc.

e. Ad-mixtures, when used, shall be approved by Lite Crete®, Inc.

Note:
Calcium chloride or any admixture containing chloride salts shall not be used in concrete if mesh reinforcement or aluminum conduits or members are embedded in the concrete.

3. Mix Proportions and Concrete Physical Properties

a. The cellular concrete shall contain not more than four parts sand to 1 part cement by weight. The cement content shall be not less than 564 lb. (6 bags) per cubic yard.

b. The dry density of the cellular concrete shall be between 105 and 116 pcf, and the compressive strength shall not be less than 1,000 psi in 28 days when tested in accordance with ASTM C39-71.

4. **Mixing**

a. All mixing and placing shall be done with equipment of a type approved by Lite Crete®, Inc. The cellular concrete shall be pumped or otherwise conveyed to the point of application and shall be screeded and finished to produce a flat surface.

b. Materials for cellular concrete may be batched in a ready mixed concrete plant and transported to the job site in a truck mixer. The foaming agent shall be introduced into the mixer

Note: Since the Sound Stop concrete floor fill is installed after roofing any dry wall is completed, bad weather won't interrupt the installation schedule or damage the floor. Floor material is placed after roofing, dry wall, doors, and windows are installed.

5. Installation

a. Prior to placing the cellular concrete, the sub floor shall be covered with an asphalt-impregnated felt or paper, liquid membrane or other coating securely fastened to the floor, which will prevent bond of the cellular concrete to the floor.

b. Control joints shall be incorporated within cellular concrete slabs at all door thresholds and in large undivided areas in excess of 400 square feet or where the length exceeds the width by a factor of 1.5.

c. The cellular concrete shall be lifted, pumped, or otherwise conveyed to the point of application with equipment of such size and design to ensure continuous flow to the delivery point.

d. The cellular concrete shall be screeded to 1 5/8 inch thickness and darbied to produce a flat surface suitable for the application of the specified floor covering.

e. Cellular concrete shall not be left exposed as a wearing surface, but should be covered with a wear-resistant surface.

6. Protection

a. The concrete surface shall be protected from damage by wind, rain, or freezing weather and construction operations for at least 24 hours or until such time as the material is strong enough to bear a man's weight without leaving a visible imprint in the concrete surface.

7. Quality Control

a. Field Control: A wet density test shall be made at least once per hour during each day's pour. Method of test shall be according to ASTM C138-71T, except that when filling the measure the concrete shall be lightly, tapped and not rodded. Variations in excess of 5 percent above or below the recommended wet density determined after discharge at point of placement will require a modification of mix proportions, mixing procedure, or both. Note: In general, wet densities may be taken as approximately 10 pcf higher than the oven dry densities.

b. Laboratory Tests: Compressive strength tests and dry unit weight determinations shall be performed at least once for each day's pour. Specimens shall be made according to ASTM C192-69 except that when filling the specimen, the concrete shall be lightly tapped and not rodded. The specimens shall be tested in accordance with ASTM C39-71.

8. Sound Tests (Riverbank)

a. S.T.C.-50 in carpeted areas. No batts in floor joists. No resistant channels.

b. I.I.C.-50 in hard floor areas. No batts in floor joists. Resilient channels only.

Frame Construction

1. Doorways should be framed in with an additional 1 5/8 inches to allow for the thickness of the cellular concrete.
2. If different floor coverings are to be used or both sides of the door, doorway plates should be left in. If the same floor covering is to be used, doorway plates should be cut out. Doorway plates at doors leading to the exterior should not be cut out. Plates are requires around the perimeter of stairwells to hold the cellular concrete until it sets.
3. Plaster grounds should be installed with at least a full 2-inch clearance between bottom of ground and top sub floor.
4. When drywall is used, a single plate or a 1x4 under a single plate may be used to ensure adequate backing surface for drywall nailing.

5. While cellular concrete floors minimize noise problems, noise will travel through plate and sub floor openings. Eliminating or reducing size and number of openings during construction ensures maximum noise protection.

Most trades usually install pipes and ducts through the plates. Cutouts or holes in plates for pipes and ducts should be covered with a strip of wood or sheet metal prior to concrete floor installation. All openings should be fire-stopped after installation. Toilet rings or sleeves should be set in place for a tight fit.

Bathtub or shower drain openings should be covered with a 2x8 or 2x10, cut to cover the opening, or openings may be frames with 1x2 or 2x4 pieces. After installation of the plumbing, the openings must be plugged.

Procedure before installing Lite-Crete®

1. **Job broom clean, and bracing removed.**
2. **Building inspection of framing, nailing, etc.**
3. **If single plate-include at thresholds.**
4. **If double plate-omit top plate only at thresholds.**
5. **Tub and toilet drains roughed in, or blocked with removable 2 x 8.**
6. **Aluminum sliding doors protected.**
7. **Roof deck dried in.**
8. **Access adequate for equipment and truck traffic.**

Procedure after installing Lite-Crete®

1. **Avoid traffic for 24 hours.**
2. **Eliminate dropping or dragging heavy objects, until concrete has reached maximum set (tubs, toilets, drywall).**
3. **Avoid concentrated loads, that would deflect framing.**
4. **Remove at once spilled grout, mastic, or mortar.**

Standard Specification References:

AMERICAN SOCIETY FOR TESTING AND MATERIALS

C 33 STANDARD SPECIFICATIONS FOR CONCRETE AGGREGATE.
C 39 COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIFICATIONS.
C150 STANDARD SPECIFICATION FOR PORTLAND CEMENT.
C172 SAMPELING FRESH CONCRETE.
C494 CHEMICAL ADMIXTURES FOR CONCRETE.
C595 STANDARD SPECIFICATION FOR BLENDED HYDRAUTIC CEMENTS.

DEPARTMENT OF COMMERNCE

PS 1-66 SOFTWOOD PLYWOOD, CONSTRUCTION AND INDUSTRIAL.

FEDERAL SPECIFICATION

UU-B-79 Building Paper, Vegetable Fiber: (Kraft, Water-proofed, Water Repellent and Fire Resistant).

Testing References

Field Wet Density: ASTM C 138-71T
COMPRESSIVE STRENGTH: ASTM C 39-71
Field Specimen: ASTM C 192-69
FOAMING AGENT: ASTM C.09.03.08.06 May 1973
HUD: Use of Materials Bulletin No. 65
Fire Ratings: See UL: L512 & L514 & ICBO & UBC 43-C & Portland Cement Association RD004.01B
American Plywood Association Laboratory Report No. 95 for:

a. ASTM Designation-C78-44, Flexural Strength Test for Concrete.
   a. Compressive Strength Test
   b. Repetitive Load Test
   c. Concentrated Load Test
   d. Moisture Content Test

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ES REPORT™

ER-3404

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ICBO Evaluation Service, Inc. • 5360 Workman Mill Road, Whittier, California 90601 • www.icboes.org

Filing Category: FIRE-RESISTIVE CONSTRUCTION—Other Fire-resistive Construction

LITE-CRETE CELLULAR CONCRETE FLOOR-CEILING ASSEMBLIES

LITE-CRETE, INC.
1921 NORTH GATEWAY
SUITE 102
FRESNO, CALIFORNIA 93727

1.0 SUBJECT

Lite-Crete Cellular Concrete Floor-Ceiling Assemblies.

2.0 DESCRIPTION

2.1 General:

Lite-Crete is a cellular concrete produced by the addition of a Lite-Crete air-entraining agent. One part of the agent to 40 parts of water produces a stabilized foam when applied through a nozzle at 90 pounds per square inch of air pressure. When added to a conventional ready-mix concrete, neat cement or sand-grout mix this produces a density of 100 pounds per cubic foot to 135 pounds per cubic foot and strengths from 1,000 psi to 3,000 psi. The density is controlled by timing of air injection and by weighing.

The Lite-Crete assemblies noted in this report are fire-resistive, nonfire-rated and sound-transmission systems. The vertical and lateral design of these systems are not a part of this report and must be justified in conformance with the 1997 *Uniform Building Code*™ (UBC).

2.2 Fire-resistive Applications:

2.2.1 One-hour Fire-resistive Wood-floor Ceiling: A minimum $1^1/_2$-inch-thick layer of cellular concrete is applied over a plywood deck covered with either a liquid membrane consisting of hydrocarbon wax resin and mineral spirits which is brushed, rolled or sprayed onto the deck at the rate of one gallon per 300 square feet of deck area or an approved building paper. A 4-inch-wide strip of asphalt-impregnated kraft paper is stapled in place to cover the joints. In lieu of the asphalt-impregnated kraft paper, a United States Gypsum all-purpose caulking compound may be used to seal the joints. The cellular concrete is used as a substitute for 1-inch tongue-and-groove finish flooring or plywood required by footnote 13 of Table 7-C of the UBC for a one-hour fire-resistive rating in wood-floor construction. Plywood may be unblocked if not required by Table 23-II-H of the UBC. The density of the concrete shall be a minimum 100 pounds per cubic foot, for this type construction and the mix proportions should include seven sacks of cement for one cubic yard of concrete with 35 percent air entrainment.

2.2.2 One-hour Noncombustible Fire-resistive Floor-Ceiling Construction: This assembly consists of a steel deck spanning between U.S. Steel's No. 18 gage, $7^1/_4$-inch-deep Super C steel joists conforming to ASTM A 446 Grade D or an approved equivalent, spaced 2 feet on center. The steel deck is covered with a 1-inch-thick (above top of flute) 100 pounds per cubic foot density, Lite-Crete cellular concrete fill. The mix proportions are identical to those set forth in Section 2.2.1, above. A $^5/_8$-inch-thick Type X gypsum wallboard ceiling is applied to the bottom of the joists. The steel deck is installed with corrugations perpendicular to the joists and fastened with 12-24 by $^7/_8$-inch hex washer-head TEKS/4 spaced 15 inches on center. The gypsum wallboard is installed perpendicular to the joists and fastened to each joist with 1-inch-long Type S-12 screws spaced 12 inches on center. End joints are staggered and blocked with a $^5/_8$-inch thick, 6-inch-wide strip of Type X gypsum wallboard with $1^1/_2$-inch-long Type G screws spaced 12 inches on center. The strips lap the ceiling wallboard 3 inches.

The steel deck must be minimum No. 28 gage (.016 inch), with $^9/_{16}$-inch-deep corrugations pitched at $2^1/_2$ inches. Maximum span of the joists is 13 feet 9 inches. The bottom flange is braced at midspan with 2-inch-wide No. 18 gage metal straps secured to the joists with $^1/_2$-inch-long Type S-12 panhead screws. Splices in the straps are lapped one joist. Ceiling openings are permitted only as set forth in Chapter 7 of the UBC.

2.2.3 Nonfire-rated Floor System: This system consists of galvanized steel decking with a minimum $1^1/_2$-inch-thick cellular concrete having a density as described in Section 2.2.1.

2.3 Sound Transmission:

The airborne and impact sound-insulation ratings for the floor/ceiling assemblies described herein have a sound-transmission classification (STC) and an impact-insulation classification (IIC) of 50 or better.

2.3.1 Assembly 1: See Figure 1.

a. Floor Covering: High D-back Antron nylon, three-ply 20-ounce carpeting, with 38-ounce backing may be used, provided the total weight is at least 58 ounces per square yard.

b. Lite-Crete Cellular Concrete: One-and-one-half-inch thickness, and a density of 100 to 125 pounds per cubic foot.

c. Vapor-barrier paper: (optional).

d. Subfloor: Half-inch plywood installed in accordance with the UBC.

e. Two by ten-inch wood joists.

f. Batt insulation: Three-and-one-half-inch glass fiber insulation (R-11).

g. Ceiling board: One-half-inch-thick gypsum board nailed directly to joist in accordance with the UBC.

2.3.2 Assembly 2: See Figure 1.

a. Floor Covering: Cushioned Pacemaker Vinyl 3202 congoleum or equivalent.

b. Lite-Crete Cellular Concrete: One and one-half-inch thickness, and a density of 100 to 125 pounds per cubic foot.

c. Vapor-barrier paper: (optional).

d. Subfloor: Five-eighths-inch plywood installed in accordance with the UBC.

e. Two-by-ten-inch wood joists.

f. Batt insulation: Three-and-one-half-inch glass fiber insulation (R-11).

g. Ceiling board: One-half-inch gypsum board is attached to resilient channels at 24 inches on center with Type S, $1^1/_4$-inch drywall screws at 12 inches on center.

2.3.3 Assembly 3: See Figure 1.

a. Floor Covering: Nine-by-nine-by-one-eighth-inch-thick vinyl floor tile adhered to the cellular concrete in accordance with the manufacturer's instructions.

b. Lite-Crete Cellular Concrete: One-and-five-eighths-inch thickness and a density of 100 to 125 pounds per cubic foot.

c. Vapor barrier paper: (optional).

d. Subfloor: Five-eighths-inch plywood installed in accordance with the UBC.

e. Two-by-ten-inch wood joists.

f. Batt insulation: Three-and-one-half-inch glass fiber insulation (R-11), with vapor-barrier tabs stapled to the sides of each joist in a manner that the bottom vapor barrier at midspan will just be in contact with the resilient channels below.

g. Ceiling board: USG Type RC-1 resilient channels spaced 24 inches on center perpendicular to the joists and attached thereto with one and $^1/_4$-inch Type S drywall screws at 16 inches on center, and a layer of $^5/_8$-inch-thick Type X gypsum wallboard attached with $1^1/_4$-inch Type S drywall screws at 12 inches on center. All joints are treated with compound and tape.

2.3.4 Assembly 4: See Figure 2.

a. Floor Covering: Nylon 501 carpeting with cotton scrim backing weighing a total of 0.43 psf. The carpeting is 100 percent nylon pile yarn weighing 20 ounces per square yard of carpeting with a $^3/_{16}$-inch to $^5/_{32}$-inch textured pile height. An acceptable alternate is Mohawk 40-ounce hall hair carpeting and padding must be a minimum 0.7 psf.

b. Lite-Crete Cellular Concrete: One and one-half-inch thickness, and a density of 100 to 125 pounds per cubic foot.

c. Vapor-barrier paper: (optional)

d. Subfloor: One-half-inch plywood installed in accordance with the UBC.

e. Two-by-ten-inch wood joists.

f. Ceiling board: Five-eighths-inch Type X gypsum board attached to Donn DG-8 resilient furring strips at 24 inches on center running perpendicular to the joists. The gypsum board is placed perpendicular to the furring strips with adjacent end joints staggered 48 inches.

One and one-fourth-inch Type S drywall screws at 12 inches on center attach the board to the furring strips. All joints are treated with compound and tape.

2.3.5 Assembly 5: See Figure 2.

a. Floor Covering: One-and-one-half-inch felt pad, 40 ounces per square yard minimum. Shag carpet, 34 ounces per square yard minimum. The carpet and pad must also be approved by Lite-Crete, Inc., with the prescribed conditions.

b. Lite-Crete Cellular Concrete: One-and-one-half-inch thickness, and a density of 100 to 125 pounds per cubic foot.

c. Vapor-barrier paper: (optional).

d. Subfloor: One-half-inch plywood installed in accordance with the UBC.

e. Two-by-ten-inch wood joists.

f. Ceiling board: One-half-inch gypsum board nailed directly to joists in accordance with the UBC.

2.4 Identification:

All containers are labeled with the manufacturer's name and the word "Lite-Crete." A card noting the name of the installer and the date of installation is issued to each project owner. Steel deck and gypsum wallboard bear a label containing the product name and manufacturer's name and address.

3.0 EVIDENCE SUBMITTED

Descriptive literature, specifications, reports on fire tests conducted in accordance with UBC Standard 7-1, results of horizontal diaphragm test and reports of sound-transmission tests conducted in accordance with ASTM E 90, E 413, and E 492 have been submitted.

4.0 FINDINGS

That the use of Lite-Crete Cellular Concrete described in this report complies with the 1997 *Uniform Building Code*™ (UBC), subject to the following conditions:

4.1 The cellular concrete is applied by factory-approved applicators.

4.2 The slab dimensions between screeds are limited to a maximum of 20 by 20 feet.

4.3 Where the slab widths change at alcoves and other similar recesses, the slabs must be reinforced with a 12-inch-wide by 16-inch-long strip of 4-inch by 4 X 4 - W0.5 X W0.5 welded-wire mesh extending each side of the corners at an angle of 45 degrees.

4.4 In lieu of Item 3 above, plates may be inserted through or a weakened plane joint made with a continuous $1^1/_2$-inch-by-1-inch-thick light gage steel or plastic angle divider. Dividers are not used in the one-hour fire-resistive wood floor or horizontal diaphragm systems.

4.5 The slab is scored at doorways serving rooms larger than 200 square feet.

4.6 Edge blocking of plywood subfloor is not required where $1^1/_2$ inches of cellular concrete is placed over the subfloor. Blocking is required only for blocked diaphragm shear values as set forth in the UBC and Table 23-II-H.

This report is subject to re-examination in two years.

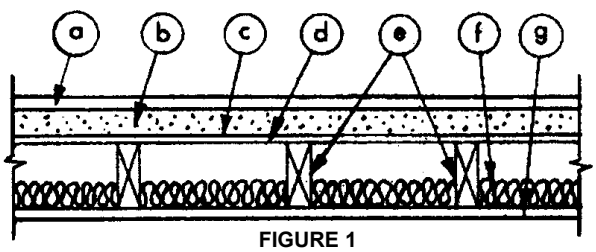

FIGURE 1

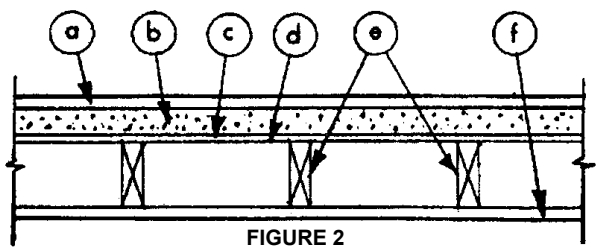

FIGURE 2

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration

Form Approved
OMB No. 1218-0072

CELLULAR CONCRETE LLC **MEARLCRETE® Division**	**Emergency Telephone Number** **(888) 235-5015 in** USA International Call **(908) 245-9500**
P.O. Box 208	Telephone Number for Information: 908 245-9500
220 West Westfield Avenue	Date Prepared: November 18, 1999
Roselle Park, NJ 07204	Name of Contact: Tom Fesenmaier
Product Identification: Mearlcrete® Liquid Foam Concentrate- Lite-Crete Plus	

Section II - Hazard Ingredients/Identity Information

NAME	CAS No.	APPROX %	OSHA PEL mg/m3	ACGIH TLV mg/m3	OTHER
Hexylene glycol	107-41-5	7.0	125n	25a,n	n/a
Ferrous sulfate heptahydrate	7782-63-0	1.7	1u	1u	n/a
a= parts per million		n=ceiling limit	u=as Fe	n/a= Not available	

HMIS Rating: Health: 1 Flammability: 1 Reactivity: 0 Personal Protection: A			
Boiling Point:	>100 C	Weight Per Gallon:	9.6 lbs.
Vapor Pressure (mm Hg.):		Melting Point:	
Vapor Density (AIR = 1):	n/a	Evaporation Rate:	slower than ether
Percent Volatile by Wt: 56.0			
Appearance and Odor:			

Section IV - Fire and Explosion Hazard Data

Flash Point: >212° F Tag Closed Cup	LEL. N/A UEL. N/A
Extinguishing Media: Alcohol foam •Carbon Dioxide • Dry Chemical, Water Fog	Unusual Explosion and Fire Hazards: Emits toxic fumes under fire conditions Special Fire Fighting Procedures: self –contained breathing apparatus (SCBA) and full protective equipment recommended

Section V - Reactivity Data

Route(s) of Entry:	Inhalation ?: Yes?	Skin & Eyes ?: Yes	Ingestion ?: Yes
Health Hazards *(Acute and Chronic)* Acute: Mild skin and eye irritation • Chronic: None Known			
Stability: Stable			
Incompatibility: Strong acids and oxidizers			
Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
Hazardous Decomposition: Carbon monoxide, carbon dioxide, and oxides of nitrogen.			
Hazardous Polymerization: Will not occur			
Signs and Symptoms of Exposure: Mild Skin and eye irritation			
Medical Conditions Generally Aggravated by Exposure: Preexisting eye, skin and respiratory disorders			
Emergency and First Aid Procedures: Inhalation = Move to fresh air •Eye & Skin Contact: Flush with clean water for 15 minutes. Call a physician. •Ingestion: If victim is conscious drink two glasses of water and induce vomiting			

Section VII - Precautions for Safe Handling and Use

Disposal: Follow all Local, Provincial, State and Federal disposal regulations.		
Respiratory Protection: In high vapor concentration, used approved vapor respirator.		
Ventilation: Provide general dilution	Local Exhaust: Provide local exhaust ventilation	Special: Utilize proper disposal containers
Storage and Handling: Normal dry storage • Store away from fire and high heat sources • Follow general industrial hygiene	Mechanical: Butyl rubber gloves • Chemically resistant goggles • Provide safety eye wash solution and station	Other: Do not ingest • Avoid skin and eye contact.
NOTICE: The ingredients in this product are listed on the TSCA & Canadian DSL inventories.		
.The information contained in this MSDS document is based on data from sources considered reliable, but Cellular Concrete LLC has no control over this data. Cellular Concrete LLC does not guarantee the accuracy or completeness of this data. Cellular Concrete LLC urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with this product. The reader should consider consulting other reference works and individual experts in ventilation, toxicology and or fire prevention as necessary for appropriate use and understanding the data in this MSDS.		

* U.S.G.P.O.: 1986 - 491 - 529/45775