Celcore Roof Insulation

CELCORE INCORPORATED
775 US Hwy 70 West
Black Mountain, N.C. 28711
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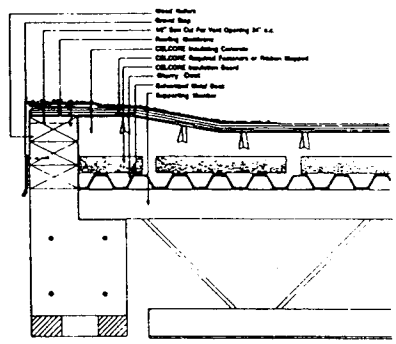
(704) 669-4874 Fax
Web Site: www.celcoreinc.com
Fax on Demand: (704) 669-4874

CELCORE Insulating Concrete Plus Polyboard Over Corrugated Metal



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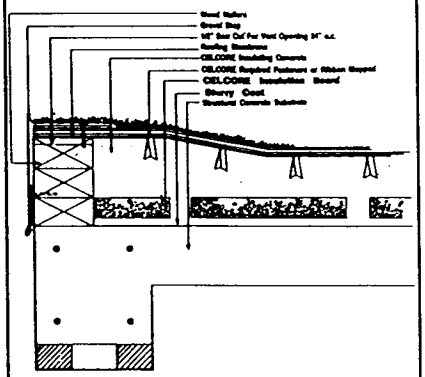

THE PRODUCT

Basic Use: Celcore Foam Concentrate is mixed with water and generated into a preformed foam for addition to a cement/water slurry mixture to create a closed cell cellular concrete of a specific density. Typical air dry densities are in the range of 28 - 39 pcf. Oven dry densities are in the range of 24 - 36 pcf. Typical usages for Celcore Cellular Concrete are poured-in-place insulating applications and geotechnical fills.

Celcore Cellular Insulating Concrete is a key component of a Celcore Cellular Insulating Roof Deck System. Celcore Cellular Insulating Concrete may be used in conjunction with expanded polystyrene board to produce a thermally efficient, fire rated, Underwriter's Laboratories Approved, Factory Mutual Approved, South Florida Approved insulation assembly.

Celcore Cellular Concrete can be poured over some existing roof membranes in reroofing applications, galvanized steel deck form, precast concrete, or poured-in-place structural concrete. Celcore monolithic insulating concrete roof deck fills placed over metal deck form can be designed into structures as shear diaphragms. These composite systems provide good resistance to shear forces which may result from wind or seismic activity. Shear diaphragms provide bracing to the structures they cover acting to transfer and distribute an acting load force through-out the structure.

Composition and Materials: Celcore Foam Concentrate contains no synthetic surfactants. It is comprised of natural saponified rosins and is protein stabilized. Celcore Foam Concentrate is non-corrosive, non-hazardous and readily biodegradable. It is packaged in (5) gallon pails and displays the UL and FMRC mark on the product label.

CELCORE'S TECHNICAL INFORMATION is available through print and electronic media. You have two options for obtaining the following information electronically. Celcore's Web Site - www.celcoreinc.com or via Celcore's Fax on Demand System by calling (704) 669-4874 and following the menu instructions. The information that is available is as follows:

(1) CSI formatted specification for Celcore's Roof Insulation -
(2) Roof over existing roof specifications
(3) Celcore PVA curing compound specifications
(4) Thin Patch patching material specifications
(5) Diaphragm design information and tables
(6) Product Data Sheets
(7) Celcore Quality Control Guidelines
(8) Factory Mutual Product Approval Listings
(9) South Florida Product Approval Listings
(10) Material Safety Data Sheets
(11) Geo Technical specifications
(12) Polystyrene board configuration & installation

THE ENVIRONMENT

Celcore Roof Insulation is a superb product to use in meeting the World's environmental concerns. The foundation for Celcore's Foam Concentrate does not contain man made chemicals. Celcore Foam Concentrate is non-corrosive, non-hazardous, and biodegradable.

NO "CFC'S" • NO "FIBER GLASS" • NO "ASBESTOS" • NO "VERMICULITE"

Attachment 1

Celcore Roof Insulation

CELCORE CELLULAR CONCRETE TECHNICAL DATA

Cast (wet) Density	-	36 to 49 pounds per cubic foot (Pcf)
Air Dry Density	-	27 to 39 Pcf
Compressive Strength	-	175 pounds per square inch (Psi)
Drying Shrinkage	-	0.20 to 0.40
Thermal Expansion	-	5.0 to 7.0 x 10^{-6} / °F
Thermal Resistance	-	"R" = 2.22 per inch thick (average for temp. range 18° - 190°F)

TYPICAL CELCORE MIX DESIGNS

Cast Density	36 pcf	38 pcf	40 pcf	42 pcf	45 pcf
Type I Cement	663 lbs.	703 lbs.	742 lbs.	782 lbs.	850 lbs.
Mix Water	29 gals.	31 gals.	32 gals.	34 gals.	37 gals.
Celcore Foam	19.80 cu. ft.	19.32 cu. ft.	18.94 cu. ft.	18.51 cu. ft.	17.75 cu. ft.
Concrete Yield	1 cu. yard	1 cu. yard	1 cu. yard	1 cu. yd.	1 cu. yard
Theroretical Psi	175 psi	225 psi	250 psi	300 psi	350 (+) psi

"U" FACTOR TABLES FOR CELCORE INSULATING FILL OVER CORRUGATED METAL DECKS & STRUCTURAL CONCRETE SUBSTRATES

Thickness of CELCORE concrete over top of deck corrugations, structural concrete or EPS Insulation	Thickness of EPS in inches R/In.=3.85 Nominal density @ 1 pcf	26 Gauge metal deck 15/16" Corrugation depth			24 Gauge metal deck 1 1/2" Corrugation depth			22 Gauge metal deck 1 1/2" Corrugation depth			Structural Concrete Substrate Thickness 5 1/2" Density 142 pcf		
		Weight of the Deck Composite in lbs./sq. ft.	"U" FACTOR No ceiling HEAT FLOW UP	DOWN	Weight of the Deck Composite in lbs./sq. ft.	"U" FACTOR No ceiling HEAT FLOW UP	DOWN	Weight of the Deck Composite in lbs./sq. ft.	"U" FACTOR No ceiling HEAT FLOW UP	DOWN	Weight of CELCORE Insulating Deck in lbs./sq. ft.	"U" FACTOR No ceiling HEAT FLOW UP	DOWN
2"	0	6.08	.139	.132	6.91	.128	.123	7.20	.128	.123	4.00	.140	.113
	1	6.68	.090	.087	7.49	.086	.083	7.78	.086	.083	5.08	.091	.088
	1 1/2	6.73	.077	.075	7.54	.074	.072	7.83	.074	.072	5.13	.078	.075
	2	6.77	.067	.065	7.58	.065	.063	7.87	.065	.063	5.17	.067	.066
	2 1/2	6.81	.059	.058	7.62	.057	.056	7.91	.057	.056	5.21	.060	.058
	3	6.85	.053	.052	7.66	.052	.051	7.95	.052	.051	5.25	.054	.051
	3 1/2	6.89	.048	.047	7.70	.047	.046	7.99	.047	.046	5.29	.049	.048
	4	6.93	.044	.043	7.74	.043	.042	8.03	.043	.042	5.33	.044	.044
2 1/2"	0	7.08	.123	.117	7.91	.114	.110	8.20	.114	.100	5.00	.124	.118
	1	7.68	.083	.080	8.49	.079	.077	8.78	.079	.077	6.08	.084	.081
	1 1/2	7.73	.072	.070	8.54	.069	.067	8.83	.069	.067	6.13	.072	.069
	2	7.77	.060	.061	8.58	.061	.059	8.87	.061	.059	6.17	.063	.062
	2 1/2	7.81	.056	.055	8.62	.054	.053	8.91	.054	.053	6.21	.057	.055
	3	7.85	.051	.050	8.66	.049	.049	8.95	.049	.049	6.25	.051	.049
	3 1/2	7.89	.046	.045	8.70	.045	.044	8.99	.045	.044	6.29	.047	.046
	4	7.93	.042	.042	8.74	.041	.041	9.03	.041	.041	6.33	.042	.042
3"	0	8.08	.106	.102	8.91	.100	.096	9.20	.100	.096	6.00	.107	.103
	1	8.68	.075	.073	9.49	.072	.070	9.78	.072	.070	7.08	.076	.074
	1 1/2	8.73	.066	.064	9.54	.063	.062	9.83	.063	.062	7.13	.066	.063
	2	8.77	.058	.057	9.58	.057	.055	9.87	.057	.055	7.17	.059	.057
	2 1/2	8.81	.052	.051	9.62	.051	.050	9.91	.051	.050	7.21	.053	.052
	3	8.85	.048	.047	9.66	.046	.046	9.95	.046	.046	7.25	.048	.047
	3 1/2	8.89	.044	.043	9.70	.043	.042	9.99	.043	.042	7.29	.044	.043
	4	8.93	.040	.040	9.74	.039	.039	10.03	.039	.039	7.33	.040	.040

The above values include proper allowance for Winter and Summer conditions and the BUR.
The "U" Factor is based on 36 pcf wet density Celcore Cellular Insulating Concrete.

(CRI 1/97)

CELCORE "R" VALUE
TESTING PROCEDURE

COO-4703-26

Advanced Energy Systems Division

LIGHTWEIGHT CONCRETE MATERIALS AND STRUCTURAL SYSTEMS FOR WATER TANKS FOR THERMAL STORAGE

FINAL REPORT

Prepared by
R.W. Buckman, Jr.
G.G. Elia
Y. Ichikawa

DECEMBER 1980

Prepared for
The United States Department of Energy
Under Contract EM78-C-02-4703.A000

Westinghouse Electric Corporation
Advanced Energy Systems Division
P.O. Box 10864
Pittsburgh, Pennsylvania 15236

Attachment 2

Center For Appl. d
Engineering, Inc.
SM Materials Testing Services

April 7, 1997

Mr. Jose E. Fernandez
Cellucrete Corp.
11905 N.W. 99th Ave.
Hialeah Gardens, FL 33018

Dear Mr. Fernandez:

I have perused the Westinghouse report titled "Lightweight Concrete Materials and Structural Systems for Water Tanks for Thermal Storage" (C00-4703-26) and dated December 1980. The test method used in this report does not conform to any ASTM consensus industry accepted thermal test method. The four (4) methods generally accepted are ASTM C177 (guarded hot plate), C518 (heat flow meter), C236 (guarded hot box) and C976 (calibrated hot box).

If you have any questions, please contact me at (813) 578-4351.

Sincerely,

R. G. Miller, PhD, P.E.
Manager
Materials Testing Services

RGM:dds