DREW FOAM

Companies

GEOFOAM

Expanded Polystyrene blocks used as lightweight fill in Geotechnical applications.

Bridge Abutments - Soil Stabilization - Pavement Insulation
Retaining Walls – Landscape Structures – Foundations

In this application the approach to a bridge is being built on a 30 foot thick layer of Geofoam to protect the bridge from earthquake damage. This location in southern Indiana is near the New Madrid fault that effects much of the Midwest. Once the base of this site was prepared and leveled, it took workers only a few days to stack the light weight blocks. The crew was able to pour concrete less than two weeks after this photo was taken.

If traditional fill had been used the amount of equipment and man power required would have been much more extensive. It would have taken several months longer to complete the project because of the amount of time required to allow the fill to settle.

Traditional earth fills are heavy and tend to settle over time. EPS Geofoam weighs only about 1% as much as soil or gravel. Type 22 Geofoam @10% strain deformation, can support in excess of 2800 lbs per square foot. In other words an area the size of a standard automobile (5' x 12') can support over 84 tons. This is more than sufficient to handle the weight of the road as well as any traffic that may be present.

Geofoam has been used for decades in Europe, Canada and parts of the United States and has proven not to settle or deteriorate over time. A Geofoam application in Norway was recently excavated and found to have the exact same strength properties today as it did in the early 1960's when it was installed.

One advantage that EPS has over other fill materials is its resistance to water damage. Even if the site is below ground water the strength of the EPS Geofoam is not compromised. The integrity of the blocks remains unchanged when buried for years beneath soil and water.

This three man crew is using a simple "hot wire" cutter to cut eight foot long blocks into pie shaped wedges to fit the radius on a highway entrance ramp. Because geofoam was used there was no lateral pressure on the retaining wall. No anchors or complicated system of supports was needed to protect the retaining wall. Once the blocks were brought to the site they were easily moved and stacked by the three man crew.

Because walls can be kept vertical, the construction of elevated roadways does not require the typical amount of space for sloping backfill.

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Geofoam Specifications

ASTM D 6817-02 Classifications			EPS 12	EPS 15	EPS 19	EPS 22	EPS 29
Property	**Units**	**ASTM Test**					
Compressive Resistance at 1%Strain Deformation	Min psi (kPa)	D 1621, C165	2.2 (15)	3.6 (25)	5.8 (40)	7.3 (50)	10.9 (75)
at 5% Strain Deformation	Min psi (kPa)		5.1 (35)	8.0 (55)	13.1 (90)	16.7 (115)	24.7 (170)
at 10% Strain Deformation	Min psi (kPa)		5.8 (40)	10.2 (70)	16.0 (110)	19.6 (136)	29.0 (200)
Flexural Strength	Min psi (kPa)		10 (69)	25.0 (172)	30.0 (207)	40.0 (276)	50.0 (345)
Oxygen Index	Min volume %		24	24	24	24	24
Density, minimum	Min lb/ft3 (kg/m3)	C303	0.70 (11.2)	0.90 (14.4)	1.15 (18.4)	1.35 (21.6)	1.80 (28.8)

ASTM C 578 Specifications

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Typical Physical Properties of EPS Insulation
Specification Reference ASTM-C578-85

Property		Units	ASTM Test	Type I	Type VIII	Type II	Type IX
Density, Minimum		(Pcf)	C303 or D1622	0.9	1.15	1.35	1.8
Thermal Conductivity	at 25 deg F	BTU/(hr)	C177 or	0.23	0.22	0.21	0.2
K Factor	at 40 deg F	(sq.ft.)(F.in)	C518	0.24	0.235	0.22	0.21
	at 75 deg F			0.26	0.255	0.24	0.23
Thermal Resistance	at 25 deg F	at 1 inch		4.35	4.54	4.76	5
R- Value	at 40 deg F	thickness		4.17	4.25	4.55	4.76
	at 75 deg F			3.85	3.92	4.17	4.35
Strength Properties Compressive 10% Deformation		psi	D1621	10~14	13~18	15~21	25~33
Flexural		psi	C203	25~30	30~38	40~50	50~75
Tensile		psi	D1623	16~20	17~21	18~22	23~27
Shear		psi	D732	18~22	23~25	26~32	33~37
Shear Modulus		psi	-	280~320	370~410	460~500	600~640
Modulus of Elasticity		psi	-	180~220	250~310	320~360	460~500
Moisture Resistance WVT		perm in	E96	2.0~5.0	1.5~3.5	1.0~3.5	0.6~2.0
Absorption (vol)		%	C722	less than 4.0	less than 3.0	less than 3.0	less than 3.0
Capillary		~	~	none	none	none	none
Coefficient of Thermal Expansion		in./(in.)(F)	D696	0.000035	0.000035	0.000035	0.000035
Maximum Service Temperature Long-Term		deg F		167	167	167	167
Intermittent				180	180	180	180

All values based on data available from HuntsmanCnemical, ARCO Chemical, and BASF Corporation.