P-EBA (Pre-hydrated)

CEMENTING SERVICE BULLETIN

11/29/91

P-EBA (PETROCHEM-EXTENDER BENTONITE ADDITIVE)

TECHNICAL DATA

The extending properties of P-EBA are greatly enhanced by mixing P-EBA with the mix water and allowing it to completely hydrate prior to blending in the cement. Approximately 30 minutes is needed to completely hydrate P-EBA with fresh water. Although additional time is required, the efficiency of P-EBA as an extender can be increased by as much as 400% . On large jobs this results in a considerable savings.

PROPERTIES

PETROCHEM MATERIAL	FORM	SP. GR.	ABSOLUTE VOLUME
P-EBA	Light Brown Powder	2.65	0.0454 gal/lb

SAFETY

Eyes:	Flush eyes with water for 5 minutes. If irritation persists, get medical attention.
Skin:	Not likely a problem. Wash with water.
Inhalation:	Not likely a problem. Move to fresh air.

DISCUSSION

When P-EBA is dry mixed with cement and added to water, it never completely hydrates. This is because of the effect of water-soluble materials in the cement, such as calcium oxide. When P-EBA is pre-hydrated with fresh water before adding cement, it absorbs a much greater volume of water.

A slurry containing 2% P-EBA BWOC pre-hydrated with fresh water will absorb as much water as a slurry prepared with 8 % P-EBA dry blended with cement. As a result, by pre-hydrating the P-EBA, much more water can be used in the slurry without water separation. A comparison of slurry properties using pre-hydrated versus dry blended P-EBA is shown in Table I.

SALT WATER GEL

Attapulgite is a special clay used to prepare a salt-water mud and as a gelling agent in salt cement slurries. It is commonly called salt-water gel. By pre-hydrating attapulgite clay with seawater, the efficiency of the gel can be increased by as much as 500 % over a dry blended cement-gel mixture.

THE EFFECT OF SEA WATER

P-EBA can be pre-hydrated in seawater or light brine, but the salt inhibits the hydration of the gel and the yield of the slurry is reduced. The efficiency of the P-EBA is reduced to about 200% . In other words, a 2% pre-hydrated gel slurry is equivalent to 4% dry-mixed gel.

THICKENING TIME

Thickening times of a slurry are dependent on the amount of water in the slurry. The thickening time of a pre-hydrated P-EBA slurry , for all practical purposes, is the same as the thickening time of a dry blended slurry having the same amount of mix water per sack.

COMPRESSIVE STRENGTH

Pre-hydrating the P-EBA does not appreciably change the compressive strength as long as the amount of mix water is not increased.

VISCOSITY

The initial viscosity of pre-hydrated P-EBA slurry is about the same as that for a dry blended slurry of the same density.

TABLE I
A COMPARISON OF PREHYDRATED AND DRY-BLENDED P-EBA SLURRY PROPERTIES

Percent Pre-hydrated P-EBA	Percent Dry Blend P-EBA	Fresh Water gal/sk	Slurry Weight, lbs/gals		Slurry Yield, cut ft/sack	
			Pre-hydrated	Dry Blend	Pre-hydrated	Dry Blend
0	0	5.2	---	15.6	---	1.18
0.5	2	6.4	14.8	14.8	1.34	1.35
1.0	4	7.6	14.1	14.2	1.50	1.52
1.5	6	8.8	13.5	13.7	1.66	1.69
2.0	8	10.0	13.1	13.3	1.83	1.86
2.5	10	11.2	12.7	12.9	1.99	2.03
3.0	12	12.4	12.4	12.6	2.16	2.20
4.0	16	14.8	11.9	12.2	2.48	2.55
5.0	20	17.2	11.5	11.8	2.81	2.89