

ENVIROPLUG®

Medium and Coarse

SEALING & PLUGGING AGENT

Enviroplug® (Medium & Coarse) is made of pure Wyoming Bentonite and was the first bentonite chip developed and marketed. Enviroplug has been used for abandoning holes since 1983. Enviroplug is used in sealing and plugging applications.

Enviroplug is an exceptionally versatile product used for abandoning cased and uncased boreholes, sealing casing, isolating zones, sealing grounding rods and heat pump conductor holes, stemming and sealing seismic shot holes, sealing excavations, and for any vertical sealing to prevent water movement up or down a borehole.

Enviroplug is introduced in a dry state, which prevents shrinkage and provides a reserve expansion capacity. When absorbing water, Enviroplug swells to fill voids, exerting pressure against all surfaces to create a flexible, low-permeability seal.

Enviroplug falls easily through standing water and thin drilling fluids, filling the column from the bottom upward. Expect a fall rate of 1 ft/s, which has been achieved through water depths of over 1600 ft.

PHYSICAL AND CHEMICAL PROPERTIES:

Appearance: Grey to tan granules
Particle Size: -3/8" + 1/4" (Medium), -3/4" + 3/8" (Coarse)
Bulk Density: 68 lb/ft³ (Medium), 64 lb/ft³ (Coarse)
Moisture Content: 15% ± 2
Permeability: 1×10^{-9} cm/sec

TYPICAL CHEMICAL ANALYSIS

SiO ₂	61.4%	MgO	1.70%	Other	0.07%
Al ₂ O ₃	18.1%	CaO ₃	0.40%	H ₂ O	7.80%
Fe ₂ O ₃	3.50%	TiO ₂	0.20%	LOS (Loss on Ignition)	4.40%
K ₂ O	0.10%	Na ₂ O	2.30%		

MIXING & HANDLING

Add directly down the annulus. Avoid breathing dust. It is advisable to use a dust mask and eye protection while mixing all powdered products.

Dry fill volume: 20.8L (5.5 gal/bag)

WHMIS: Controlled (see SDS)

TDG: Not regulated

Packaging: 22.68lg (50lb sack)/bulk

TYPICAL E.P. TOXICITY ANALYSIS

	Standard (ppm)	Set Grout (ppm)
Arsenic	5.0	<0.10
Barium	100.0	0.50
Cadmium	1.0	<0.05
Chromium	5.0	<0.10
Lead	5.0	<0.10
Mercury	0.2	<0.02
Selenium	1.0	<0.05
Silver	5.0	<0.10



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CASED HOLES OR UNCASED HOLES

For decommissioning cased or uncased holes larger than 3" diameter, either **Enviroplug Coarse** or **Medium** can be used. If static water is present, pour chips from the bag at a rate of 1 1/2 to 2 minutes per 50 pounds. A funneling device with a 2" opening can be used to insure a constant flow of material into the hole. Should the water level be quite low - a screen can be used to drop out "fines" from the material before entering the hole.

For holes less than 3" in diameter use **Enviroplug Medium**. The technique is the same but a funnel with a 1" to 1 1/2" opening is recommended to regulate the flow. Holes with less than a 1" diameter should be plugged with a pumpable material such as **Enviroplug Grout**.

GROUNDING ROD AND HEAT PUMP CONDUCTOR HOLES

After drilling a 4 1/2" to 5" diameter hole to the desired depth, simply center the grounding rod with the ground wire attached or the circulating loop from the heat pump in the bore hole. In the case of a wet hole condition, pour hole **Enviroplug Medium** slowly (1 1/2 - 2 minutes per bag) down the bore alternating each bag from one side of the hole to the other. In dry hole conditions, fill the hole with water, then add the **Enviroplug Medium** displacing the water upward. If the water dissipates into formations while filling the hole, continue to add water while adding **Enviroplug Medium** until the hole is sealed. Adding 5 gallons of water per 50 pound bag is usually adequate to provide hydration. Expected values for hydrated chips: Thermal Conductivity 0.50 Btu/hr-ft-°F Resistivity 2.40 ohm-meters.

ABANDONING DUG WELLS

Completely filling dug wells with bentonite chips can be very expensive and unnecessary. To economically decommission and stabilize dug wells, **Enviroplug Coarse** should be placed from the bottom section upward to 3 feet above the water bearing zone. Alternate sections of sand, fine gravel, or clay upward with a 12" layer of **Enviroplug Coarse** or **Medium** every 5 to 6 feet.

Any of the above methods should be finished off approximately 3 feet below the surface, then filled with native soil or cement depending upon local regulatory requirements.

SEALING CASING

Slowly pour **Enviroplug Medium** into annulus and allow to drop to the gravel pack. For bentonite grouting, continue to pour **Enviroplug Medium** directly into annulus, alternating from one side of the casing to the other. This aids in even distribution of particles around the casing. To avoid bridging problems pour at a rate of 1 1/2 to 2 minutes per bag. If available, a funnel-type device with a 1 1/2" bottom opening has proven very successful in regulating the flow into the hole and thus reducing the chances for bridging. When used in conjunction with pumpable grouts, **Enviroplug Medium** can be used immediately above the sand or gravel pack and at the top of the hole for a more rigid seal.

SEISMIC SHOT HOLES

After the hole is drilled and charge is placed, pour **Enviroplug Coarse** slowly into the hole (1 1/2 - 2 minutes per bag). In wet hole conditions, add enough **Enviroplug Coarse** to fill up to the static water level. In a dry hole, add 2 to 4 bags directly over the charge. Where auger drills are used or where water is injected, pour 2 bags per 50 feet of hole depth.