

DRILL-THIN® THINNER



New-Generation, High-Performance, Multipurpose Water-Based Mud Conditioner

The introduction of Drill-Thin® thinner, a modified tannin compound, comes after several years of extensive research. Drill-Thin® thinner was developed to replace chrome lignosulfonates. Our research efforts were focused toward producing a tannin-based thinner that would perform like a chrome-lignosulfonate to give rheology control without the adverse environmental effects inherent with thinners containing chrome. Laboratory tests have shown Drill-Thin® thinner to be more effective for controlling rheology than either chrome-lignosulfonate or chrome-free lignosulfonate, depending on application. Tables I, II, and III are test results from lab muds. All muds tested were 12.2 ppg in fresh water. The tables show the effect of temperature, aging, and contamination under normal conditions and at high

Advantages :

- Contains no chrome
- Superior to commonly used thinners containing chrome, yet much more environmentally acceptable
- Excellent performance at low concentrations
- Compatible with conventional fresh water, seawater, and saturated salt water systems
- Not temperature-dependent: works at low or high temperatures
- Not pH-dependent: works equally well in low-pH and high-pH systems
- Superior performance, tolerating salt and gypsum contamination
- LC 50 > 1,000,000 ppm for shrimp (*Mysidopsis bahia*) at a concentration of four pounds per barrel

Table 1
Tests in Fresh Water Mud

	Initial Results			Aged 16 Hours at 176 °F		Aged 16 Hours at 300 °F	
	Ppb	PV/YP	Gels	PV/YP	Gels	PV/YP	Gels
Base Mud*		24/18	11/53	30/24	12/52	34/44	31/74
Drill-Thin® Thinner	0.5	24/1	2/3	26/11	3/10	30/29	15/43
	1.0	24/0	1/2	22/10	2/3	26/19	10/40
	20.	22/0	1/1	23/2	2/2	25/8	3/21
CF Lignosulfonate (Chrome-Free)	2.0	22/9	7/45	26/11	3/21	27/33	30/57
	4.0	21/11	6/44	24/10	2/25	22/28	11/54
	6.0	21/6	5/40	23/2	2/17	20/9	4/37
Lignosulfonate A	2.0	23/9	3/35	26/12	3/21	29/24	26/51
	4.0	21/6	2/17	24/10	2/19	25/12	3/32
	6.0	22/3	2/8	26/5	2/12	26/5	3/14
Lignosulfonate B	2.0	22/8	4/35	25/13	5/30	27/24	27/51
	4.0	26/1	2/9	28/6	2/9	28/16	8/38
	6.0	24/1	2/6	26/6	2/5	34/4	4/29

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Table II
Fresh Water Mud Contaminated With NaCl or Gypsum

	1.0 ppb NaCl <u>Initial Results</u>			0.5 ppb Gypsum <u>Initial Results</u>	
	Ppb	PV/YP	Gels	PV/YP	Gels
Base-Mud*		11/127	94/104	23/54	56/80
Drill-Thin®	2.0	24/4	2/23	23/2	2/9
Thinner	4.0	22/0	1/2	22/0	2/2
CF Lignosulfonate	8.0	20/13	16/39	16/20	21/42
Lignosulfonate A	4.0	19/21	32/62	18/24	26/51
	8.0	21/25	22/47	21/20	19/43
Lignosulfonate B	4.0	23/30	28/56	24/25	26/50

	1.00 ppb NaCl <u>After Aging 16 Hours at 176°F</u>			0.5 ppb Gypsum <u>After Aging 16 Hours at 176°F</u>		1.00 ppb NaCl <u>After Aging 16 Hours at 300°F</u>		0.5 ppb Gypsum <u>After Aging 16 Hours at 300°F</u>	
	Ppb	PV/YP	Gels	PV/YP	Gels	PV/YP	Gels	PV/YP	Gels
Base Mud*		**	**	20/68	61/94	**	**	21/61	52/83
Drill-Thin®	2.0	26/6	2/17	23/6	2/8	27/26	14/45	23/18	9/36
Thinner	4.0	22/0	1/2	23/0	1/2	25/10	3/31	26/5	17/34
CF Lignosulfonate	8.0	19/14	10/34	19/12	14/29	21/11	11/35	16/18	17/34
Lignosulfonate A	4.0	21/26	19/48	19/19	17/39	23/16	10/42	19/13	11/36
	8.0	20/21	17/39	19/18	13/31	20/13	6/35	23/8	5/32
Lignosulfonate B	4.0	25/27	27/53	28/22	19/45	26/44	29/55	25/33	23/47

Table III
Tests In Fresh Water Mud (High Temperature Performance)

	Ppb	Initial Results			
		AV	YP	Gels	
Base Mud*		32.0	22	20	12/54
Drill-Thin®	2.0	22.0	22	0	1/1
Thinner					
Lignosulfonate A	6.0	24.0	23	2	2/7
<u>After aging 16 Hours at 400°F</u>					
Base Mud*		51.5	36	31	39/59 10.4
Drill-Thin®	2.0	35.0	29	12	3/26 8.9
Thinner					
Lignosulfonate A	6.0	34.5	29	11	7/58 10.0

*Base Mud consists of 47g bentonite, 235g P95 rotary clay and 560g barite per 1,000 ml of deionized water, pH initially adjusted to 10.2 +/- 0.1. (P95 rotary clay used to simulate drilled solids.)

** Too thick to measure accurately

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