



THINNER TESTING RESULTS

The mud thinner samples were evaluated at different concentrations in a 16.5 ppb fresh water bentonite mud. After initial testing, the samples were hot rolled overnight at 175°F and then cooled to room temperature and retested. Samples containing 2 ppb and 4 ppb thinner were then contaminated with 1 ppb calcium chloride and hot rolled over night at 175°F. After hot rolling and cooling to room temperature, the samples were again tested. As indicated by the significantly lower gel strengths, the data demonstrates the superior thinning characteristics of Drilling Specialties Company thinners compared to standard Chrome Lignosulfonate (CLS) and Chrome Free Lignosulfonates (CFS) materials sold in the market.

(Table I – 1.0 ppb initial)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|---------------------------|------|---------|---------|----|----|--------|------|
| Base Mud | ---- | 77 | 53 | 24 | 29 | 47/108 | 11.3 |
| Desco® Deflocculant | 1.0 | 48 | 24 | 24 | 0 | 1/7 | 11.2 |
| CF Desco® Deflocculant | 1.0 | 49 | 25 | 24 | 1 | 1/7 | 11.2 |
| CF Desco® II Deflocculant | 1.0 | 61 | 38 | 23 | 15 | 3/33 | 11.3 |
| Drill Thin® Thinner | 1.0 | 45 | 23 | 22 | 1 | 1/3 | 11.2 |
| CFL 1 | 1.0 | 73 | 47 | 26 | 21 | 14/68 | 10.6 |
| CFL 2 | 1.0 | 74 | 48 | 26 | 22 | 17/80 | 10.8 |
| CFL 3 | 1.0 | 71 | 48 | 23 | 25 | 20/88 | 10.7 |
| CLS 1 | 1.0 | 58 | 37 | 21 | 16 | 6/50 | 10.8 |
| CLS 2 | 1.0 | 50 | 30 | 20 | 10 | 2/45 | 11 |
| CLS 3 | 1.0 | 52 | 30 | 22 | 8 | 2/48 | 10.9 |

AFTER HOT ROLLING @ 175°F for 16 HOURS

(Table I a - 1.0 ppb)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|----------------------------------|------------|----------------|----------------|-----------|-----------|-------------|-----------|
| Base Mud | ---- | 73 | 45 | 28 | 17 | 5/47 | 10.3 |
| Desco® Deflocculant | 1.0 | 50 | 26 | 24 | 2 | 1/2 | 10 |
| CF Desco® Deflocculant | 1.0 | 47 | 25 | 22 | 3 | 1/2 | 10.4 |
| CF Desco® II Deflocculant | 1.0 | 60 | 35 | 25 | 10 | 1/5 | 10.1 |
| Drill Thin® Thinner | 1.0 | 48 | 23 | 25 | -2 | 1/2 | 10.1 |
| CFL 1 | 1.0 | 65 | 37 | 28 | 9 | 1/20 | 9.6 |
| CFL 2 | 1.0 | 61 | 35 | 26 | 9 | 1/18 | 9.9 |
| CFL 3 | 1.0 | 60 | 36 | 24 | 12 | 3/20 | 9.6 |
| CLS 1 | 1.0 | 58 | 34 | 24 | 10 | 3/25 | 10 |
| CLS 2 | 1.0 | 52 | 29 | 23 | 6 | 1/5 | 10 |
| CLS 3 | 1.0 | 55 | 33 | 22 | 11 | 3/23 | 9.6 |

(Table II - 2.0 ppb initial)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|----------------------------------|------------|----------------|----------------|-----------|-----------|-------------|-----------|
| Base Mud | ---- | 75 | 51 | 24 | 27 | 36/95 | 11.3 |
| Desco® Deflocculant | 2.0 | 52 | 26 | 26 | 0 | 2/6 | 10.6 |
| CF Desco® Deflocculant | 2.0 | 45 | 25 | 20 | 5 | 1/2 | 10.4 |
| CF Desco® II Deflocculant | 2.0 | 58 | 33 | 25 | 8 | 2/7 | 10.6 |
| Drill Thin® Thinner | 2.0 | 42 | 23 | 19 | 4 | 2/2 | 10.3 |
| CFL 1 | 2.0 | 78 | 52 | 26 | 26 | 14/123 | 10.1 |
| CFL 2 | 2.0 | 90 | 60 | 30 | 30 | 13/117 | 10.2 |
| CFL 3 | 2.0 | 73 | 48 | 25 | 23 | 9/128 | 10 |
| CLS 1 | 2.0 | 50 | 28 | 22 | 6 | 2/35 | 10.6 |
| CLS 2 | 2.0 | 48 | 28 | 20 | 8 | 1/33 | 10.8 |
| CLS 3 | 2.0 | 50 | 26 | 24 | 2 | 1/26 | 10.7 |

AFTER HOT ROLLING @ 175°F for 16 HOURS

(Table II a - 2.0 ppb)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|----------------------------------|------------|----------------|----------------|-----------|-----------|-------------|-----------|
| Base Mud | ---- | 72 | 43 | 29 | 14 | 5/30 | 10.5 |
| Desco® Deflocculant | 2.0 | 48 | 25 | 23 | 2 | 1/2 | 9.3 |
| CF Desco® Deflocculant | 2.0 | 52 | 30 | 22 | 8 | 1/3 | 9.6 |
| CF Desco® II Deflocculant | 2.0 | 54 | 31 | 23 | 8 | 2/3 | 9.6 |
| Drill Thin® Thinner | 2.0 | 44 | 22 | 22 | 0 | 2/2 | 9.4 |
| CFL 1 | 2.0 | 69 | 42 | 27 | 15 | 4/34 | 9.3 |
| CFL 2 | 2.0 | 60 | 38 | 22 | 16 | 3/23 | 9.3 |
| CFL 3 | 2.0 | 66 | 40 | 26 | 14 | 3/27 | 9.3 |
| CLS 1 | 2.0 | 48 | 27 | 21 | 6 | 3/12 | 9.4 |
| CLS 2 | 2.0 | 47 | 25 | 22 | 3 | 1/2 | 10 |
| CLS 3 | 2.0 | 50 | 27 | 23 | 4 | 1/8 | 9.6 |

AFTER CaCl₂ CONTAMINATION

(Table II b - 2.0 ppb After CaCl₂ contamination)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|----------------------------------|------------|----------------|----------------|-----------|-----------|-------------|-----------|
| Base Mud | ---- | Too thick | Too thick | Too thick | Too thick | Too thick | na |
| Desco® Deflocculant | 2.0 | 68 | 45 | 23 | 22 | 17/50 | 8.3 |
| CF Desco® Deflocculant | 2.0 | 75 | 53 | 22 | 31 | 30/66 | 8.7 |
| CF Desco® II Deflocculant | 2.0 | 95 | 67 | 28 | 39 | 27/77 | 8.6 |
| Drill Thin® Thinner | 2.0 | 58 | 38 | 20 | 18 | 17/41 | 8.3 |
| CFL 1 | 2.0 | 110 | 90 | 20 | 70 | 60/105 | 8.3 |
| CFL 2 | 2.0 | 110 | 95 | 15 | 80 | 75/118 | 8.5 |
| CFL 3 | 2.0 | 113 | 90 | 23 | 67 | 70/110 | 8.5 |
| CLS 1 | 2.0 | 88 | 70 | 18 | 52 | 48/85 | 8.6 |
| CLS 2 | 2.0 | 100 | 80 | 20 | 60 | 54/80 | 9 |
| CLS 3 | 2.0 | 90 | 68 | 22 | 46 | 48/78 | 8.7 |

(Table III - 4.0 ppb initial)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|---------------------------|------|---------|---------|----|----|--------|------|
| Base Mud | ---- | 77 | 53 | 24 | 29 | 47/108 | 11.3 |
| Desco® Deflocculant | 4.0 | 45 | 25 | 20 | 5 | 1/3 | 10.1 |
| CF Desco® Deflocculant | 4.0 | 45 | 21 | 24 | -3 | 1/3 | 10.4 |
| CF Desco® II Deflocculant | 4.0 | 51 | 24 | 27 | -3 | 1/3 | 10.4 |
| Drill Thin® Thinner | 4.0 | 45 | 22 | 23 | -1 | 1/3 | 10.4 |
| CFL 1 | 4.0 | 110 | 74 | 36 | 38 | 13/158 | 9.4 |
| CFL 2 | 4.0 | 107 | 71 | 36 | 35 | 8/133 | 9.2 |
| CFL 3 | 4.0 | 92 | 60 | 32 | 28 | 5/115 | 9.2 |
| CLS 1 | 4.0 | 48 | 25 | 23 | 2 | 3/8 | 10.4 |
| CLS 2 | 4.0 | 45 | 25 | 20 | 5 | 2/7 | 10.7 |
| CLS 3 | 4.0 | 50 | 25 | 25 | 0 | 2/5 | 10.4 |

AFTER HOT ROLLING @ 175°F for 16 HOUR

(Table III a - 4.0 ppb)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | pH |
|---------------------------|------|---------|---------|----|----|------|------|
| Base Mud | ---- | 73 | 45 | 28 | 17 | 5/47 | 10.3 |
| Desco® Deflocculant | 4.0 | 45 | 25 | 20 | 5 | 1/3 | 8.8 |
| CF Desco® Deflocculant | 4.0 | 47 | 25 | 22 | 3 | 1/7 | 9 |
| CF Desco® II Deflocculant | 4.0 | 50 | 25 | 25 | 0 | 1/3 | 8.9 |
| Drill Thin® Thinner | 4.0 | 38 | 19 | 19 | 0 | 1/3 | 9 |
| CFL 1 | 4.0 | 70 | 42 | 28 | 14 | 2/30 | 8.5 |
| CFL 2 | 4.0 | 75 | 45 | 30 | 15 | 4/38 | 8.5 |
| CFL 3 | 4.0 | 83 | 52 | 31 | 21 | 3/30 | 8.4 |
| CLS 1 | 4.0 | 47 | 26 | 21 | 5 | 1/7 | 8.7 |
| CLS 2 | 4.0 | 47 | 25 | 22 | 3 | 1/3 | 9.5 |
| CLS 3 | 4.0 | 51 | 28 | 23 | 5 | 1/3 | 8.6 |

(Table III b – 4.0 ppb After CaCl₂ contamination)

| Sample | PPB | 600 rpm | 300 rpm | PV | YP | GELS | PH |
|---------------------------------------|------|-----------|-----------|-----------|-----------|-----------|-----|
| Base Mud | ---- | Too thick | Too thick | Too thick | Too thick | Too thick | na |
| Desco [®] Deflocculant | 4.0 | 67 | 44 | 23 | 21 | 20/50 | 8.1 |
| CF Desco [®] Deflocculant | 4.0 | 76 | 53 | 23 | 30 | 27/60 | 8.3 |
| CF Desco [®] II Deflocculant | 4.0 | 77 | 53 | 24 | 29 | 20/60 | 8.3 |
| Drill Thin [®] Thinner | 4.0 | 52 | 28 | 24 | 4 | 2/18 | 8.3 |
| CFL 1 | 4.0 | 104 | 80 | 24 | 56 | 50/100 | 8 |
| CFL 2 | 4.0 | 96 | 75 | 21 | 54 | 48/85 | 8 |
| CLS 1 | 4.0 | 92 | 67 | 25 | 42 | 33/67 | 8.1 |
| CLS 2 | 4.0 | 83 | 60 | 23 | 37 | 30/63 | 8.7 |
| CLS 3 | 4.0 | 80 | 55 | 25 | 30 | 27/60 | 8.2 |

Desco[®] Deflocculant, CF Desco[®] Deflocculant, CF Desco[®] II Deflocculant and *Drill Thin[®] Thinner* are products of Chevron Phillips Chemical Company/Drilling Specialties Company

PACKAGING

Packaging: 25 pound multi-wall paper bags, 80 bags per pallet

ORDERING

Orders may be placed by calling 1-800-423-3985 (Houston, TX) or 832-813-4563 (Houston, TX), or +322-689-1202 (Rotterdam) or 65-6517-3276 (Singapore)

For more information on Drilling Specialties Company products see our web site at www.drillingspecialties.com

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