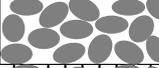
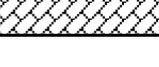


| ■ Primary Function □ Secondary | | Viscosity | Thinner | Filtration Control | Surfactant | Lubricant | Suspension | Inhibitor | Recommended Treatment |
|--------------------------------|---|-----------|---------|--------------------|------------|-----------|------------|-----------|-----------------------|
| Product | Description | | | | | | | | per m ³ |
| IDP-696 | Viscosifier | ■ | | □ | | | | | 20 - 40 kg |
| QUIK-GEL® | Viscosifier | ■ | | ■ | | | | | 20 - 40 kg |
| TUNNEL-GEL® SW | Salt-Water Bentonite | ■ | | ■ | | | □ | | 15 - 25 kg |
| AQUA-CLEAR® PFD | Dispersant/Thinner | | ■ | | | | | | 0,5 - 1 liter |
| EZ-MUD® GOLD | Shale/Clay stabilizer/Filtration control | | | □ | | | | ■ | 0,5 - 1,5 kg |
| N-SEAL™ | Acid soluble loss of circulation material | | | | | | | | 5 - 13,6 kg |
| PENETROL® | Non-Ionic Surfactant | | | | ■ | | | □ | 1 - 2 liter |
| QUIK-TROL® | Filtration Control | □ | | ■ | | | | | 0,5 - 1 kg |
| QUIK-TROL® LV | Low Viscosity Filtration Control | | | ■ | | | | □ | 0,5 - 1,5 kg |
| SODA ASH | Calcium reduction/pH adjustment | | | | | | | | 0,5 - 2 kg |
| BIO-BORE™ | Biodegradable fluid | | | ■ | | | □ | | 25 - 40 kg |
| POLY-BORE™ | Borehole stabilizer | □ | | | | | | ■ | 0,5 - 1,5 kg |
| NO-SAG® | Suspension enhancer | □ | | | | | ■ | | 0,3 - 1,5 kg |

| Encountered Geology | Formation | Problems | Products | | Recommended Fluid Formulation | |
|---------------------|---|-------------------------------------|---------------------|--------------|---------------------------------|----------------------------|
| Cobbles |  | Caving Formation/Lost Circulation | IDP-696 / QUIK-GEL® | N-SEAL™ | 30 - 40 kg/m ³ | 5 - 13,6 kg/m ³ |
| | | Excessive Torque | QUIK-TROL® LV | | 0,5 - 1 kg/m ³ | |
| Gravel |  | Caving Formations | IDP-696 / QUIK-GEL® | N-SEAL™ | 30 - 35 kg/m ³ | 5 - 13,6 kg/m ³ |
| | | Cuttings Transport/Excessive Torque | QUIK-TROL® LV | | 0,5 - 1 kg/m ³ | |
| Sand & Gravel |  | Fluid Loss | IDP-696 / QUIK-GEL® | N-SEAL™ | 25 - 35 kg/m ³ | 5 - 13,6 kg/m ³ |
| | | Borehole Stabilization | QUIK-TROL® LV | | 0,5 - 1 kg/m ³ | |
| Coarse Sand |  | Borehole Stabilization | IDP-696 / QUIK-GEL® | | 25 - 30 kg/m ³ | |
| | | Suspension/Cuttings Transport | QUIK-TROL® LV | | 0,5 - 1 kg/m ³ | |
| Fine Sand |  | Borehole Stabilization | IDP-696 / QUIK-GEL® | | 25 - 30 kg/m ³ | |
| Sand & Clay |  | Clay Dispersion | IDP-696 / QUIK-GEL® | EZ-MUD® GOLD | 20 - 25 kg/m ³ | 0,5 - 1 kg/m ³ |
| | | Loss of Flow | QUIK-TROL® LV | | 0,5 - 1 kg/m ³ | |
| Dry Clay |  | Hydrating Solids | IDP-696 / QUIK-GEL® | EZ-MUD® GOLD | 20 - 25 kg/m ³ | 0,5 - 1 kg/m ³ |
| | | Loss of Flow | PENETROL® | | 1 - 2 liter/m ³ | |
| Swelling Clay |  | Hydrating Solids | IDP-696 / QUIK-GEL® | EZ-MUD® GOLD | 20 - 25 kg/m ³ | 0,5 - 1 kg/m ³ |
| | | High Torque | PENETROL® | | 1 - 2 liter/m ³ | |
| Sticky Clay |  | Bit Balling/Loss of Flow | IDP-696 / QUIK-GEL® | PENETROL® | 20 - 25 kg/m ³ | 1 - 2 liter/m ³ |
| | | Plugged Nozzles | AQUA-CLEAR® PFD | EZ-MUD® GOLD | 0,25 - 0,5 liter/m ³ | 0,5 - 1 kg/m ³ |

| Drilling Fluid Property | Test Equipment | Reading | Result | Recommended Action |
|-------------------------|---------------------------|---------------------------|--|--|
| Total Hardness | Hardness Indicator Strips | Hardness > 100 mg/l | Poor product yield & performance | Add Soda Ash to make-up water at 0,5 - 1 kg/m ³ to reach desired hardness of less than 100 mg/l and pH range of between 8.5-9.5 |
| | | | Reduced viscosity production | |
| pH | pH Indicator Strips | pH < 7.0 | Reduced mixing efficiency | |
| | | | Increased mixing time | |
| Mud Weight | Baroid Mud Balance | Mud Weight > 1.2 kg/liter | High pump pressure | Refresh whole fluid |
| | | | Whole Fluid Losses | Non-recirculating - increase pump rate, decrease penetration rate |
| Marsh Funnel Viscosity | Marsh Funnel | Low < 40 sec | Poor cuttings transport | Check hardness & pH, increase bentonite or polymer concentration |
| | | High > 75 sec | No dropout of solids | Dilute or add thinner, reduce bentonite or polymer concentration |
| Filtration Rate | API Filterpress | Filtrate > 15 ml/30 min | Borehole instability & filtrate invasion | Add filtration control polymers |
| | | Filtrate < 15 ml/30 min | ← Target Range | Monitor and maintain fluid properties |
| Sand Content | Sand Content Test Kit | Sand content > 2% | Excessive wear to pumps | Non-recirculating - increase pump rate, decrease penetration rate |
| | | Sand content < 2% | ← Target Range | Monitor and maintain fluid properties |

Mudmaster



Vertical Drilling

Markets

- Waterwell
- Horizontal Directional Drilling
- Tunneling (Micro)
- Geothermal
- Core Drilling

Capabilities

- Research and Development
- Customer Training Seminars
- International Training Centre
- Field Support Engineers
- Quality Assured Production Wide Distribution
- Customer Partnering



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