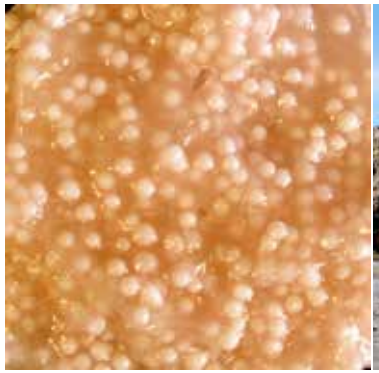
# TITAN® 1000 LD

## Sensitized Bulk Emulsion

Technical Information




### Product Description

TITAN 1000 LD is a booster sensitive, high performance, economical, repumpable bulk emulsion explosive specifically formulated to provide superior blasting performance in nearly all open pit applications where large diameter boreholes are used. TITAN 1000 LD can be used alone, blended with up to 45% ANFO for direct pumping to the bottom of water-filled boreholes or as the emulsion explosive component for augerable Heavy ANFO blends. The percentage of emulsion in TITAN 1000 LD Heavy ANFO blends can be varied to best match specific blasting requirements. Refer to the data table at right for the physical properties and loading methods for some typical TITAN 1000 LD emulsion/ANFO explosive blends.

### Application Recommendations

- Only ANFO manufactured with emulsion compatible AN prills is recommended for use in TITAN 1000 LD Heavy ANFO blends.
- The minimum cast booster recommended to prime TITAN 1000 LD and TITAN 1000 LD Heavy ANFO blends is 454 g (16 oz).
- **ALWAYS** double prime when bulk explosive columns exceed 6 m (20 ft). One primer should be positioned near the bottom of the hole and the second nearer the top of the explosive column.

## Properties

SDS #1062

| | | 1000 | 1070 | 1050 | 1040 | 1030 |
|---|---|---|---|---|---|---|
| **Percent Emulsion** | | 100 | 70 | 50 | 40 | 30 |
| **Density** | (g/cc) Avg | 1.25 | 1.29 | 1.30 | 1.25 | 1.15 |
| **Energy**[a] | (cal/g) | 680 | 740 | 780 | 800 | 820 |
| | (cal/cc) | 850 | 955 | 1,015 | 1,000 | 945 |
| **Relative Weight Strength**[a,b] | | 0.77 | 0.84 | 0.89 | 0.91 | 0.93 |
| **Relative Bulk Strength**[a,b] | | 1.17 | 1.32 | 1.41 | 1.39 | 1.31 |
| **Velocity**[c] | (m/sec) | 5,800 | 5,600 | 5,400 | 5,000 | 4,700 |
| | (ft/sec) | 19,000 | 18,500 | 17,700 | 16,400 | 15,300 |
| **Detonation Pressure**[c] (Kbars) | | 105 | 101 | 95 | 78 | 64 |
| **Gas Volume**[a] (moles/kg) | | 45.0 | 44.8 | 44.4 | 44.2 | 44.0 |
| **Water Resistance** | | Excellent | Excellent | Good | Fair | Poor |
| **Minimum Diameter** | (mm) | 90 | 115 | 150 | 125 | 125 |
| | (inches) | 3.5 | 4.5 | 6 | 5 | 5 |
| **Loading Method** | | Pump | Pump | Auger | Auger | Auger |

[a] All Dyno Nobel Inc. energy and gas volume values are calculated using PRODET™, a computer code developed by Dyno Nobel Inc. for its exclusive use. Other computer codes may give different values.

[b] ANFO = 1.00 @ 0.82 g/cc

[c] Confined in 150 mm (6 in) diameter at average density.

### Hazardous Shipping Description

Explosive, Blasting, Type E 1.5D UN 0332 II




See Product Disclaimer on page 2

DYNO® Dyno Nobel

Groundbreaking Performance™

# TITAN® 1000 LD

**Technical Information**

**Application Recommendations (continued)**

- Do not use with detonating cord in borehole diameters less than 200 mm (8 in).
- **NEVER** load TITAN 1000 LD Heavy ANFO blends into boreholes where standing water is present! Only load TITAN 1000 LD Heavy ANFO Blends with 50% or greater ANFO into dry or dewatered boreholes. Blends with greater than 65% ANFO are not recommended in applications where water may seep back into the borehole, unless a liner is used.
- **ALWAYS** use pumped TITAN 1000 LD emulsion or TITAN 1000 LD emulsion/ANFO blends when standing water remains in a borehole.
- Maximum borehole sleep time is two (2) weeks. Where geology is wet and extended sleep times are anticipated, **ALWAYS** limit ANFO percentage in TITAN 1000 LD Heavy ANFO blends to less than 50%. When product will sleep overnight and less water resistant blends are being considered, consult your Dyno Nobel representative for loading recommendations.
- **NEVER** store blended TITAN 1000 LD ANFO blends in bulk delivery equipment, tanks or bins. TITAN 1000 LD and ANFO should be blended and loaded directly into the borehole. Once blended, use only equipment specially designed to blend and load emulsion/ANFO or Heavy ANFO blends.
- **ALWAYS** use only equipment specially designed to blend and load Heavy ANFO. Ensure safety systems are operational before each use.
- Bulk delivery equipment should be calibrated periodically to ensure blend quality and explosive performance. Ensure safety systems are operational before each use.
- Routinely monitor the TITAN 1000 LD / ANFO blend density to ensure that equipment remains in calibration during loading.

**Transportation, Storage and Handling**

- TITAN 1000 LD can be stored for 3 months at temperatures between -18º C and 32º C (0º F and 90º F). Older product should be used first and all storage tanks should be kept clean of residual product.
- Use only pumps which have been approved by Dyno Nobel for 1.5 emulsion explosive transfer. Pump type, pump speed, worn pump parts, repeated repumping and pumping against high hose pressures can increase TITAN 1000 LD viscosity and decrease shelf life.
- **ALWAYS** monitor emulsion pump performance and check pumps periodically for excessively worn parts. Design storage facilities to minimize repeated pumping.
- Transport, store, handle and use TITAN 1000 LD in compliance with federal, state, provincial and local laws governing bulk explosives.



**Dyno Nobel Inc.**
2795 East Cottonwood Parkway, Suite 500, Salt Lake City, Utah 84121 USA
Phone 800-732-7534 Fax 801-328-6452 Web www.dynonobel.com