

# TITAN<sup>®</sup> 1000

## Technical Information



### Unsensitized Bulk Emulsion Matrix



#### Product Description

TITAN 1000 is an unsensitized, repumpable, bulk emulsion matrix specifically formulated for augered mixing with bulk ANFO to manufacture TITAN 1000 Heavy ANFO blends. TITAN 1000 Heavy ANFO blends with 50% or less emulsion are booster sensitive and provide excellent blasting performance in surface blasting applications where boreholes are dry or dewatered before loading. The emulsion percentage of TITAN 1000 Heavy ANFO blends can vary from 5% to 50% to best match specific blasting requirements. Refer to the data table at right for the physical properties of typical TITAN 1000 Heavy ANFO explosive blends.

#### Application Recommendations

- TITAN 1000 emulsion matrix is shipped as an oxidizer and, for best results, must be blended with 50% or more ANFO before use.
- Only ANFO manufactured with emulsion compatible AN prills is recommended for use in TITAN 1000 Heavy ANFO blends.
- The minimum cast booster weight recommended to prime TITAN 1000 Heavy ANFO blends with 50% or greater ANFO content 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 explosives column.

### Properties

SDS  
#1052

	1050	1040	1030	1025
<b>Percent Emulsion</b>	50	40	30	25
<b>Density</b>				
(g/cc) Avg	1.32	1.25	1.15	1.10
(g/cc) Max	1.35	1.28	1.18	1.13
<b>Energy<sup>a</sup></b>				
(cal/g)	780	800	820	830
(cal/cc)	1,030	1,000	945	915
<b>Relative Weight Strength<sup>a,b</sup></b>	0.89	0.91	0.93	0.94
<b>Relative Bulk Strength<sup>a,b</sup></b>	1.43	1.39	1.31	1.27
<b>Velocity<sup>c</sup></b>				
(m/sec)	5,000	4,800	4,700	4,600
(ft/sec)	16,400	15,800	15,300	15,000
<b>Detonation Pressure<sup>c</sup> (Kbars)</b>	83	72	64	58
<b>Gas Volume<sup>a</sup> (moles/kg)</b>	44.4	44.1	44.0	43.9
<b>Water Resistance</b>	Good	Fair	Poor	Poor
<b>Minimum Diameter(mm)</b>	200	150	125	100
(inches)	8	6	5	4
<b>Loading Method</b>	Auger	Auger	Auger	Auger

<sup>a</sup> 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.

<sup>b</sup> ANFO = 1.00 @ 0.82 g/cc

<sup>c</sup> Confined in 150 mm (6 in) diameter at average density.

#### Hazardous Shipping Description

##### United States

*As Transported*

UN3375 Ammonium nitrate emulsion, 5.1 II

*As Used After Blending with Density Control Agent On-Site*

Explosive, Blasting, Type E 1.5D UN 0332 II

**Canada: As Transported & Used After Blending On-Site**

Explosive, Blasting, Type E 1.5D UN 0332 II



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### Application Recommendations (continued)

- Do not use detonating cord as downlines with TITAN 1000 Heavy ANFO blends in borehole diameters less than 8 in (200 mm).
- **NEVER** load TITAN 1000 Heavy ANFO blends into boreholes where standing water is present! Only load TITAN 1000 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 borehole liner is used.
- Before loading TITAN 1000 Heavy ANFO blend when standing water remains in a borehole, prime the hole and load a water-resistant packaged explosive until its column rises out of the water. Then, and only then, should TITAN 000 Heavy ANFO blend be loaded. At least one additional primer should be positioned in the TITAN 1000 Heavy ANFO blend column in these situations.
- Maximum borehole sleep time for TITAN 1000 Heavy ANFO blends is two (2) weeks. Where geology is wet and extended sleep times are anticipated, **ALWAYS** limit ANFO percentage in TITAN 1000 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 Heavy ANFO in bulk delivery equipment, tanks or bins. TITAN 1000 and ANFO should be blended and loaded directly into the borehole.
- **ALWAYS** and only use equipment specially designed to blend and load Heavy ANFO. Ensure safety systems are operational before each use.

### Transportation, Storage and Handling

- TITAN 1000 can be stored for 3 months at temperatures between -18° C and 32° C (0° F and 90° 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 5.1 emulsion matrix transfer. Pump type, pump speed, worn pump parts, repeated repumping and pumping against high hose pressures can increase TITAN 1000 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 in compliance with federal, state, provincial and local laws governing bulk oxidizing liquids.

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