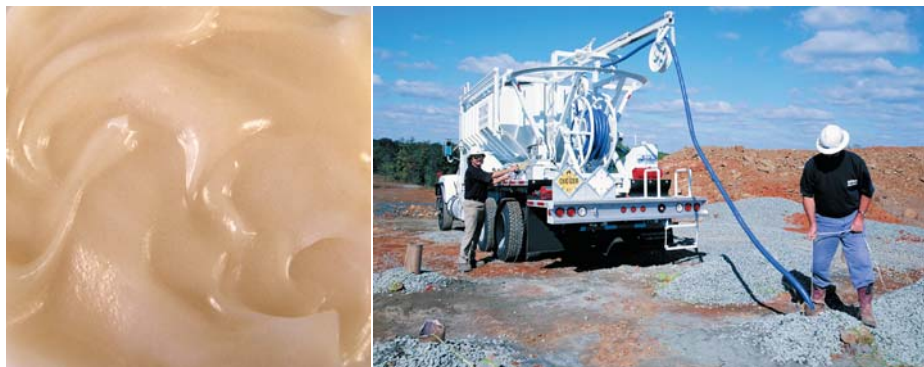


TITAN[®] 1000 SD

Technical Information



Sensitized Bulk Emulsion



Product Description

TITAN 1000 SD is a booster sensitive, high performance, repumpable bulk emulsion explosive specifically formulated to provide superior blasting performance in all open pit and quarry applications where 75 mm (3 in) and larger diameter boreholes are used. TITAN 1000 SD 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 SD emulsion/ANFO or TITAN 1000 SD Heavy ANFO blends can be varied to best match specific blasting requirements. Refer to the data table at right for the physical properties of some typical TITAN 1000 SD emulsion/ANFO explosive blends.

Application Recommendations

- Only ANFO manufactured with emulsion-compatible AN prills is recommended for use in TITAN 1000 SD emulsion/ANFO blends.
- The minimum cast booster recommended to prime TITAN 1000 SD and TITAN 1000 SD emulsion/ANFO blends and TITAN 1000 SD Heavy ANFO blends is 340 g (12 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.
- Do not use detonating cord in borehole diameters less than 159 mm (6¼ in).

Properties

MSDS
#1062

	1000	1080	1070	1050	1030	1020
Percent Emulsion	100	80	70	50	30	20
Density (g/cc) Avg	1.20	1.23	1.24	1.27	1.15	1.05
(g/cc) Max	1.24	1.28	1.30	1.30	1.18	1.08
Energy^a (cal/g)	680	720	740	771	815	835
(cal/cc)	815	885	920	980	935	880
Relative Weight Strength^{a,b}	0.77	0.82	0.84	0.88	0.93	0.95
Relative Bulk Strength^{a,b}	1.13	1.23	1.27	1.36	1.30	1.22
Velocity^c (m/sec)	5,600	5,400	4,800	4,700	4,400	4,200
(ft/sec)	18,400	17,700	15,700	15,400	14,400	13,800
Detonation Pressure^c (Kbars)	94	90	71	70	56	46
Gas Volume^a (moles/kg)	45.4	45.0	44.8	43.5	43.3	43.2
Water Resistance	Excellent	Excellent	Excellent	Good	Fair	Poor
Minimum Diameter (mm)	75	90	100	125	115	90
(inches)	3	3.5	4	5	4.5	3.5
Loading Method	Pump	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 1.5 UN 0332 II



TITAN[®] 1000 SD

Technical Information



Application Recommendations (continued)

- **NEVER** load TITAN 1000 SD Heavy ANFO blends into boreholes where standing water is present! Augered TITAN 1000 SD Heavy ANFO blends are to be used in dry or dewatered boreholes only. To produce consistently good results, wet boreholes must be dewatered. After dewatering, check the borehole to ensure there is no re-entering or residual water. As soon as the borehole is confirmed dry, immediately prime and load.
- **ALWAYS** use pumped TITAN 1000 SD emulsion or TITAN 1000 SD emulsion/ANFO blends when standing water remains in a borehole. 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.
- **NEVER** use pumpable TITAN 1000 SD and Titan 1000 SD / ANFO blends where water depths exceed 36 m (120 ft).
- 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 SD 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 SD emulsion ANFO blends and Heavy ANFO blends in bulk delivery equipment, tanks or bins. TITAN 1000 SD and ANFO should be blended and loaded directly into the borehole.
- Use only equipment specially designed to blend and load emulsion/ANFO or Heavy ANFO blends. 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 SD / ANFO blend density to ensure that equipment remains in calibration during loading.

Transportation, Storage and Handling

- TITAN 1000 SD 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 1.5 emulsion explosive transfer. Pump type, pump speed, worn pump parts, repeated repumping and pumping against high hose pressures can increase TITAN 1000 SD 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 SD in compliance with federal, state, provincial and local laws governing bulk explosives.

Product Disclaimer Dyno Nobel Inc. and its subsidiaries disclaim any warranties with respect to this product, the safety or suitability thereof, or the results to be obtained, whether express or implied, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND/OR OTHER WARRANTY. Buyers and users assume all risk, responsibility and liability whatsoever from any and all injuries (including death), losses, or damages to persons or property arising from the use of this product. Under no circumstances shall Dyno Nobel Inc. or any of its subsidiaries be liable for special, consequential or incidental damages or for anticipated loss of profits.

Dyno Nobel Inc.

2650 Decker Lake Boulevard, Suite 300, Salt Lake City, Utah 84119 USA
Phone 800-732-7534 Fax 801-328-6452 Web www.dynonobel.com

DYNO
Dyno Nobel

Groundbreaking Performance