

# TITAN<sup>®</sup> 1000ΔE<sup>™</sup>

## DIFFERENTIAL ENERGY<sup>™</sup> (ΔE) Gassed Emulsion



### Product Description

TITAN 1000ΔE is a gassed, bulk emulsion delivery system specifically designed for quarry and open pit mining operations to improve blast performance, safety and environmental conditions. Transported as an oxidizer, TITAN 1000ΔE is formulated to be sensitized during the borehole loading process using Dyno Nobel's innovative chemical gassing and emulsion processing technology. The process used to manufacture TITAN 1000ΔE enhances water resistance and detonation performance while improving loading characteristics. TITAN 1000ΔE gassing system allows the user to deliver multiple density segments in the blast hole to optimize its explosive performance for the best blast results.

### Application Recommendations

- The minimum cast booster weight recommended to prime TITAN 1000ΔE explosive is a 340 g (12 oz) cast booster.
- TITAN 1000ΔE can be used in boreholes up to 36 m (120 ft) deep.
- **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 near the collar.
- **ALWAYS** ensure primers are securely positioned in the explosive column.
- Do not use detonating cord as downlines with Titan 1000ΔE without first consulting your Dyno Nobel representative.

## Technical Information



### Properties

SDS  
#1052

<b>Density</b> (g/cc) Avg	1.20
The average loading density can be varied from about 1.00 to 1.25 g/cc to best match rock type and application requirements.	
<b>Energy<sup>a</sup></b> (cal/g)	680
(cal/cc)	815
<b>Relative Weight Strength<sup>a,b</sup></b>	0.77
<b>Relative Bulk Strength<sup>a,b</sup></b>	1.13
<b>Velocity<sup>c</sup></b> (m/sec)	5,200
(ft/sec)	17,100
<b>Detonation Pressure<sup>c</sup></b> (Kbars)	81
<b>Gas Volume<sup>a</sup></b> (moles/kg)	45.0
<b>Water Resistance</b>	Excellent
<b>Minimum Diameter</b>	
(mm)	65
(inches)	2.5
<b>Loading Method</b>	Pumped
<b>Fume Class<sup>d</sup></b>	IME1

<sup>a</sup> All Dyno Nobel Inc. energy and gas volume values are calculated using PRODET<sup>™</sup>, 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.

<sup>d</sup> Approved for underground use as IME Fume Class 1.

### Hazardous Shipping Description

TITAN 1000ΔE is made from TITAN 1000 G bulk emulsion matrix. Refer to the TITAN 1000 G Technical Information Sheet for Hazardous Shipping Description information.

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### Transportation, Storage and Handling

- TITAN 1000ΔE 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 1000ΔE 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 1000ΔE in compliance with federal, state, provincial and local laws governing bulk oxidizing liquids.

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