Differential Energy™

DYNO®

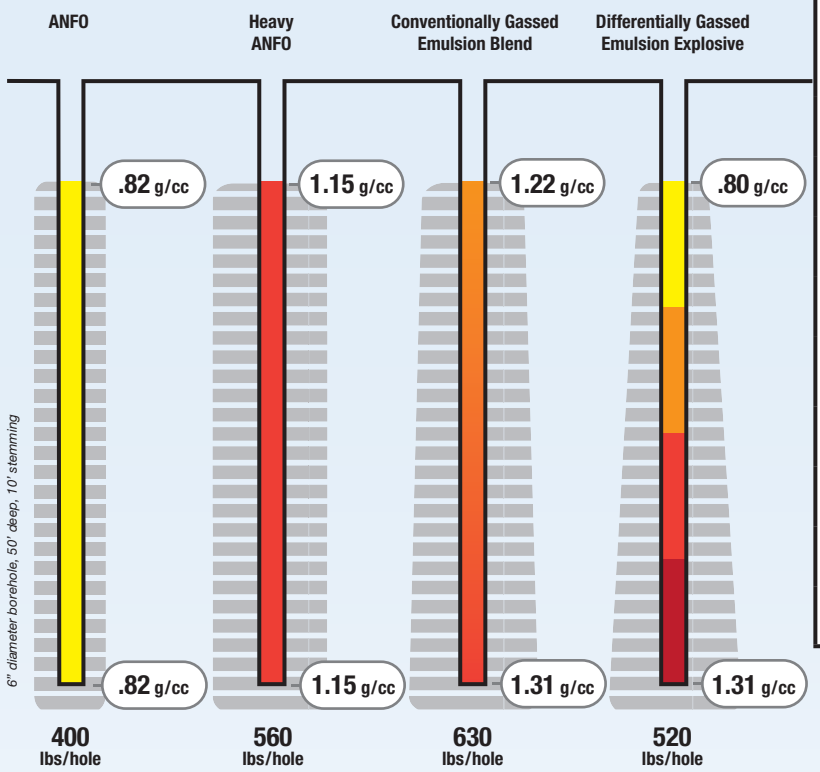
Dyno Nobel

Groundbreaking Performance™

What is DIFFERENTIAL ENERGY?

A proprietary method for controlling the explosive energy profile in a borehole.

Energy Distribution Comparison



Bulk Explosives Comparison Matrix

	ANFO	Heavy ANFO	Conventionally Gassed Emulsion Blend	Differentially Gassed Emulsion Explosive
Efficient Rock Breakage in Dry Conditions	✓	✓	✓	✓
Highly Water Resistent	–	–	✓	✓
Reduced NOx Fumes in Wet Conditions	–	–	✓	✓
Highly Efficient Use of Energy	–	–	✓	✓
Variable Energy Profile in a Single Pass	–	–	✓	✓
Precise Control of Energy Distribution	–	–	–	✓
Broadest Density Range in the Borehole	–	–	–	✓
Automated Computer-Controlled Gassing	–	–	–	✓
Highest Resistance to Groundwater Contamination	–	–	–	✓

TITAN 1000ΔE Gassed Emulsion Explosive

+

TITAN 1000ΔE Bulk Truck Equipment with ΔE Technology and Automated Controls

=

ΔE® Differential Energy™

DIFFERENTIAL ENERGY breaks new ground in...

Coal Mining

Metal Mining

Quarry Blasting

DIFFERENTIAL ENERGY™

How does DIFFERENTIAL ENERGY improve safety, productivity, and the environment?

SAFETY	✓ Product is not sensitized until it is delivered to the blasthole
	✓ Reduces potential for flyrock by placing low density gassed emulsion near the collar and/or areas of low burden
	✓ Improves highwall stability, a result of accurate control of energy at the crest
	✓ Thickened emulsion resists flowing into cracks and voids
	✓ Emulsion densities can be tailored to the hardness of the rock
PRODUCTIVITY	✓ Single product for both wet and dry conditions
	✓ Reduces explosives inventory costs and simplifies budgeting
	✓ Eliminates need to ship and store blasting agents at the site
	✓ Blast pattern expansion possible, as a result of higher detonation pressure capabilities in the hole
	✓ Optimizes quantity of product and minimizes overuse of explosives to achieve desired breakage
	✓ Precise energy placement for the application, rock hardness, and blast profile
	✓ Matches energy with geologic requirements to break hard rock seams without damaging coal
	✓ Performance isn't compromised by wet conditions or long sleep times compared to ANFO and HANFO
	✓ Optimizes blast fragmentation for increased productivity, reducing downstream processing costs
	✓ Improves blasthole loading accuracy and maximizes blast energy efficiency
	✓ Optimizes blast fragmentation reducing fines and oversize; blast energy is better distributed
	✓ Reduces wear on loading, hauling, and crushing equipment; fragmentation is more consistent
ENV.	✓ Minimizes post-blast NOx generation with high performance water resistant emulsion
	✓ Reduces groundwater contamination because thickened emulsion detonates completely

DIFFERENTIAL ENERGY Success Stories

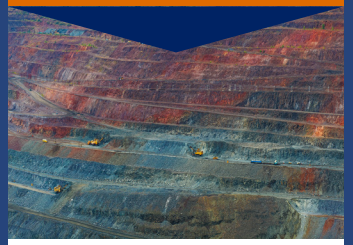
COAL MINE
CUSTOMER #1

- **10.8% Reduction** POWDER FACTOR
- **Improved** FRAGMENTATION
- **Eliminated** NOx FUMES
- **No Change** CRUSHER THROUGHPUT

METAL MINE
CUSTOMER #2 – Gold

- **18% Reduction** POWDER FACTOR
- **8% Increase** SHOVEL PRODUCTIVITY
- **Eliminated** NOx FUMES
- **No Change** CRUSHER THROUGHPUT

METAL MINE
CUSTOMER #3 – Iron Ore



- **10% Reduction** EXPLOSIVE LBS/HOLE
- **Improved** FRAGMENTATION
- **Eliminated** NOx FUMES
- **1.6% Increase** EXPLOSIVE DENSITY AT TOE

QUARRY MINE
CUSTOMER #4 – Granite

- **35% Reduction** POWDER FACTOR
- **Improved** FRAGMENTATION
- **Eliminated** NOx FUMES
- **160% Increase** CRUSHER THROUGHPUT

QUARRY MINE
CUSTOMER #5 – Limestone

- **5% Reduction** POWDER FACTOR
- **3% Increase** COURSE MATERIAL
- **Eliminated** NOx FUMES
- **1.1% Reduction** FINES

To see more Customer Success Stories, use your phone's camera to scan the QR Code:

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TITAN® is a registered trademark of Dyno Nobel Inc.

TITAN 1000ΔE Bulk Emulsions are produced from TITAN 1000 G.

800-732-7534

www.dynonobel.com

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