

# Understanding Blast Hole Explosive Column Rise using TITAN<sup>®</sup> Gassing Technology



## Background

### CALCULATIONS PROPOSED TO SAVE TIME AND MONEY

TITAN gassed emulsions have been used in quarries in the Midwest United States for some time and it has been the practice to load gassed emulsions to a predetermined collar height versus loading on a calculated load weight in the blast hole.

The problem with loading in this manner is that it doesn't take into consideration emulsion temperatures, gassing rates or gassing densities. Many believe that loading in this fashion is much faster so holes are loaded to a column height and when the explosives column reaches the desired stemming height, the hole is immediately stemmed.

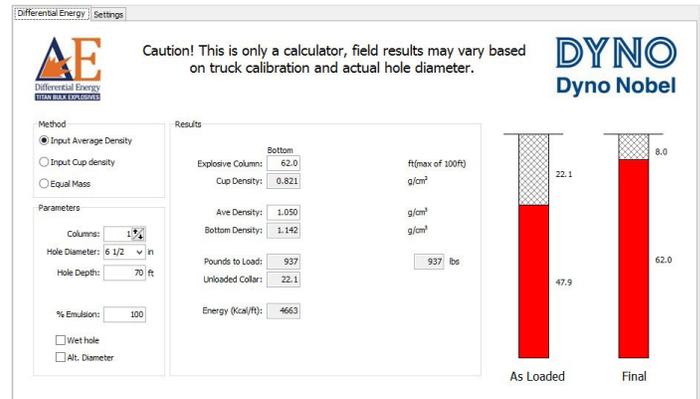
The problem with the process, based on this consultants observations, was the product never completely gassed out resulting in higher than expected densities in the blast hole and higher charge weights than expected. In addition, it often resulted in having to suck out excessive product from holes that were not immediately stemmed.

## Technology Applied

### TITAN CALCULATOR TAKES THE GUESS WORK OUT OF COLUMN RISE

The expected explosives column rise varies considerably based on hole depth and cup density making it difficult for most blasters and operators to accurately estimate. That is why they often apply rules of thumb such as one foot of rise for every 10 ft of explosives being loaded.

By utilizing the Titan Calculator, blasters can visually see what the expected bore hole rise will be based on hole depth and density. Based on this technology a load sheet was created and provided to the operator so that he could actually load the hole based on pounds required verses collar height.



## Results

### SAVINGS OF ABOUT 50 POUNDS PER HOLE REALIZED

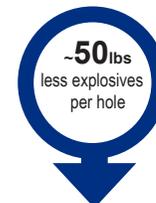
In the particular pattern where this technology was demonstrated, 98% of the explosive columns came up to the expected collar height. As a result, each hole took approximately 50 lbs less than what normally would have been loaded and the shot results were excellent.

The blaster and operator who participated in this exercise will be instrumental in helping others in the organization better understand the technology.

## Next Steps

### TRAINING AND AUDITS

After the week spent in the field with different operators and blasters an eight hour training session was conducted focusing on the TITAN Gassing technology. Each blaster was given access to the TITAN Calculator. Follow up training and audits will be conducted in the future.



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