



# VIVA INTERNATIONAL, INC

1028 North Irving St, Allentown, PA 18109-3318

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## **B-Gel Explosive Shock Absorbing Liquid**

### Technical Data

#### **Present Practices, Techniques, and Problems:**

##### Wedging, Controlled Blasting, and Saws

*Wedging:* In this method, a row of holes is drilled along a line where a fracture is desired. Metal pieces, or 'feathers', are slipped down the top of each hole with wedges between. The sized wedges are driven in between the feathers as uniformly as possible, causing the block to split along the line of holes. Wedging works well except when riffs, natural plane lines, or natural cracks interfere and cause unexpected lines of breakage. It is also time-consuming and labor intensive.

*Controlled Drilling and Blasting:* This method again involves drilling holes along a line where a fracture is desired at a greater depth than is most often required with wedging. Generally, calculated amounts of blasting material are placed in the holes along with a selected strength of detonating cord. Using instant detonation for all the holes with no delays, fracturing occurs pretty much along the desired line of holes. However, blasting for separation of stone is generally too severe to just split the stone without causing myriad cracks to appear along the hole line and within the block, resulting in more wasted stone than is economical.

*Diamond Wire and Belt Saws:* Wire and belt saws are used for stone extraction by cutting stone with abrasion in conjunction with water. Unfortunately, setting up and maintaining the system is costly, moving the set-up as necessary is cumbersome, and cutting stone with moving wire is very slow. Also, adverse geological pressure in many quarries can cause wires

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and belts to break or wear out prematurely. This can be very expensive to quarries by forcing them to buy more quantities of wire than is necessary. Inexperienced personnel and improperly maintained equipment can cause un-necessary breakages as well. This can be a major concern for quarries using such an expensive stone cutting technique.

*Comment:* As noted above, methods that cause excessive and uncontrolled cracking of stone for variable distances around the holes, are very costly. They result in shrink or crack allowances on blocks of stone that are sold. Further, the procedures necessitate the additional trimming of the blocks that have cracks. This can be time consuming and cuts down on salvageable stone, which then results in losses of projected revenues.



## **B-Gel Technology**

The stone industry is ripe for a revolutionary new tactic, product, and process to speed up the whole process of extracting useable stone from quarries. To use B-Gel, drill holes are drilled in a line the same way as in traditional bench blasting. Then, a selected size of detonating cord is placed in the holes with a specially designed material (B-Gel). A trunk line connects the cord in the holes and when detonated, it fractures the block or loaf. Loaf lift holes may be shot in a similar fashion and in many cases simultaneously with the vertical holes designed to separate out the loaf. The loaf may then be cut into individual blocks as desired, and in the same way. The speed and efficiency of loading and shooting is vastly superior to that of existing methods. Cracking around the holes is virtually eliminated resulting in substantially more undamaged stone for profitable sale. Altering the density of the B-Gel, or varying the size of the detonating cord allows a variation in the shock to the stone so that it can be tailored to maximum desirability in yield for a given quarry.

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B-Gel is used in conjunction with different sizes of detonating cord and is easy to mix on-site with inexpensive equipment. It can be loaded easily into drill holes, including lifter holes, and has greatly increased the net yield in quarries where it is used. It is made from three basic environmentally friendly materials, and it can be mixed in quantities that will last for days or weeks with only periodic stirring needed. It is white in color, mildly viscous, like a light oil or gravy, and can be mixed in a very short time in field conditions (depending on the amount of product mixed, and the speed of the blender).

B-Gel can be made in as little as a 5 or 50 gallon container or in one holding 500 gallons or more, depending upon the usage rate of a given quarry. As one progresses from a hand mix and pour operation at 50 gallons or less to that of 300+ gallons at a time, the mixing process requires different equipment. In a tank larger than a 50 gallon drum, mixer rotor blades within the tank, an air motor, and an air operated diaphragm pump are required for a proper mix. Different types of pumping systems are available from B-Gel International at around \$5,000.00 US.

In the United States, the cost of B-Gel Pre-Mix in a 1.25" hole, exclusive of the cord, generally runs between \$0.07 - \$0.15 per foot of hole. The cost variations are due to the fact that the density of the B-Gel used varies in different types of quarries, and there are volume pricing discounts for users of large quantities. Different hole sizes vary the cost per foot accordingly as well.

Eliminating explosive shot cracks can greatly increase a quarry's net yield, and thereby it's profits. Refer to the following table for an example.

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## Depth of Shot Cracks

## Net Loss Percentage

3"	11.8
6"	22.7
9"	32.6
12"	41.6

By using B-Gel, net loss percentages for a given block of stone can be reduced to zero. The example above assumes a block of stone measuring 5'x6'x8'.

B-Gel International would be pleased to assist any quarries interested in this revolutionary new technology with assistance for its actual use as it applies to their particular situation.

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