

Self-Inflating-Gas-Bags: A Techno Commercial Proposal

Dr Manoj K Patel



(Research, Findings and Views in this article are personal)

Mobile No: +91 82492 06647

Email ID: manojkumarpatel1963@gmail.com

Email ID: manjubeti@rediffmail.com

ABSTRACT:

Gas bags are amazingly effective and cost competitive, if properly used with suitable explosives, especially in presplit and deep dragline benches.

Explosives manufacturers and mining & blasting engineers may contact the author for self-inflating-gas-bags. This would help in optimization of explosives cost as well as mining cost in totality.

The Cost Savings could be as follows:

Sl. No.	Description	UoM	Savings per meter of Blast Hole by using <i>ranjanbags</i>					
			83 mm	125 mm	160 mm	260 mm	310 mm	350 mm
01	Savings / meter of blast holes charged with <i>gasbags</i>	INR / meter	120	299	502	1409	2007	2541

COMPLETE TEXT:

Speak to any mining engineer and he will mention that nothing is more nightmarish than to get a bad blast. Bad blast is like the “tip of an ice berg”; what do not become visible are the costs of – drilling, blasting, charging, man hours utilized, damage to excavating machineries, safety hazards, and last but not the least loss of productivity.

In order to get a good blast, the blasting engineer ensures perfection of at least 10 numbers of parameters, namely, Bench Height, Blast hole dia, Blast hole inclination, Burden, Spacing, Sub grade drilling, Hole depth stemming, Powder factor, Initiation sequence and Delay timings.

So, when all these parameters are supposedly have been taken care of, and still a poor blast occurs then Root Cause Analyses (RCA) points the reasons for failure towards explosives quality and explosives charging, both of which are out sourced and variable.

So, role of explosives is highly important in mining operations. It constitutes only about 10% of the excavation cost but it has got the potential jeopardize the remaining 90% of the excavation cost.

Keeping these aspects and facts in mind, and after a deliberations in different mines with various mining and blasting engineers over the last three decades period, it is felt by the author that - an explosives engineer should emphasize on the (a) explosives formulation design, (2) retention of explosives quality over a storage period in magazines / silos / blast holes, (3) SOPs followed to transport explosives, (4) SOPs followed to charge the explosives in to the blast holes, and (5) Sleeping period of explosives in the charged holes need to be robustly followed up and implemented strictly as per procedures.

So, for an explosives engineer and explosives formulation designer, it is imperative that he comes up with fool-proof robust explosives. For him - **“Sorry” is not enough. Customer satisfaction has to be on creative problem solving, not empathy”**. In another series of articles; the author is deliberating on explosive formulation designing. The 1st article entitled “Designing of Tailor Made Commercial Explosives Formulations: Part 01” is already published.

In this series of articles, we are going to discuss about “gas bags”.

Though the concept of gas bags is already time tested across the world, in this present article we are going to discuss about a very simple and cost competitive form of gas bags, named as **“ranjanbag”**.

Advantages of use of gas bags are basically,

Sl. No.	Parameter	Advantages
01	Cost Savings	Minimum 15% savings in explosives consumption.
02	Other Advantages	<ul style="list-style-type: none"> > Stemming enhancement. > Lower vibration and over pressure levels > Improved fragmentation. > Pre-splitting with large diameter holes for slope stability on surface mine high walls. > Reduce air noise and fly rock. > Pit limit stabilization to increase mineable ore in limited areas. > Limit throw for opening holes on narrow benches to contain the muck pile.

Our Development - “ranjanbags”:

Costs of the gas bags available in the market are expensive. We have developed gas bags, namely *ranjanbags* which are simple to use and are cost competitive. Apart from the advantage described in the above given table, “*ranjanbags*” are coming with following additional advantages:

Sl. No.	Parameter	Specification	Advantages
01	Material of Construction	Polymers and Co-polymers	<ul style="list-style-type: none"> > Ease of Handling > Non toxic
02	Permeability	Polythene layer is impermeable to oil and water for 30 days under hydrostatic pressure of 7-bar.	Sleep in blast holes for 30 days.
03	Complexity	<ul style="list-style-type: none"> > Simple to use. > No electronic or electrical triggering. > Mechanical triggering. > Physical turbulence is enough to inflate the bags inside the blast hole. 	Ease of use in blast face.
04	Safety Data Sheet (SDS) of chemicals used.	Available.	Safety aspects are taken care of.
05	Diameter of bags	Min 50 mm - Max 500 mm	As per customer need.
06	Length of bags	Min 0.25 m - Max 5 m	As per customer need.
07	Cost Savings	Savings in Explosives	Minimum 15% savings in explosives consumption.
08	Other Advantages		<ul style="list-style-type: none"> > Stemming enhancement. > Lower vibration and over pressure levels > Improved fragmentation. > Pre-splitting with large diameter holes for slope stability on surface mine high walls. > Reduce air noise and fly rock. > Pit limit stabilization to increase mineable ore in limited areas. > Limit throw for opening holes on narrow benches to contain the muck pile.

Use of these bags would result in substantial cost savings. Per meter savings in the boreholes of various diameters are amazing:

Sl. No.	Description	UoM	Savings per meter of Blast Hole by using <i>ranjanbags</i>					
			83 mm	125 mm	160 mm	260 mm	310 mm	350 mm
01	Savings / meter of blast holes charged with <i>ranjanbags</i>	INR / meter	120	299	502	1409	2007	2541

Explosives manufacturers and mining & blasting engineers may contact us for self-inflating-gas-bags. This would help in optimization of explosives cost as well as mining cost in totality.

References:

<https://www.mining-technology.com/contractors/drilling/mintech/mintech@gasbags.com.au> www.gasbags.com.au

