Frequently Asked Questions:

1. **Is Saver Plug Patented?**
   Yes, Saver Plug has a Global Patent.

2. **What kind of material is the Saver Plug made of?**
   The entire plug is manufactured under a patented compound material that we manufacture. Once the product has been blasted there will be nothing left of it and it will NOT have an affect on the processing of the product or the processing machinery. We supply this product into many Countries with many different mineral types. There have never been trace elements detected on the process side.

3. **What type of Savings can be achieved by using Saver Plug?**
   *Approximate **SAVINGS** on different hole diameters, maximum air deck of 1m, and assuming an explosives density of 1.15 as per below, without product cost deducted.*

89 mm OD:	7.20 Kg per meter per hole @ $8 / Kg = $ 57 per hole saving
102mm OD:	9.40 Kg per meter per hole @ $8 / Kg = $ 75 per hole saving
115mm OD:	12.0 Kg per meter per Hole @ $8 / kg = $ 96 per hole saving
127mm OD:	14.5 Kg per meter per Hole @ $8 / kg = $116 per hole saving
165mm OD:	24.5 Kg per meter per Hole @ $8 / kg = $196 per hole saving
171mm OD:	26.4 Kg per meter per Hole @ $8 / kg = $211 per hole saving
191mm OD:	32.6 Kg per meter per Hole @ $8 / kg = $261 per hole saving
250mm OD:	56.0 Kg per meter per Hole @ $8 / kg = $451 per hole saving
280mm OD:	70.0 Kg per meter per Hole @ $8 / kg = $566 per hole saving
311mm OD:	87.0 Kg per meter per Hole @ $8 / kg = $698 per hole saving

This saving is calculated on the reduction of explosives used only. There will more than likely be other benefits, like better fragmentation and better floor levels achieved resulting in quicker loading, more product to load and faster processing.

4. **In which countries are you currently selling Saver Plugs:**
   Current Clients, Countries and Mining Groups using our product with great success:

   - Australia – Iron Ore
   - Anglo American – Coal
   - AGA Group
   - Canada
   - DRC - Copper
   - Eritrea – Gold / Zinc
   - Finland – Nickel
   - Sweden - Copper
   - Ghana – Gold
   - Mali – Gold
   - Burkina Faso
   - Mauritania
   - Indonesia – Coal
   - Lesotho - Diamonds
   - Mozambique - Coal
   - Namibia – Uranium
   - Rand Gold Group
   - Russia – Iron Ore
   - Saudi Arabia – Phosphate
   - South Africa – Coal, Gold, Chrome, Platinum
   - Sweden – Copper, Iron Ore
   - Zambia – Copper

5. **Do we have to dig/drill holes deeper to accommodate the Saver Plug?**
   NO - If you're required level is 10m, that will be the depth of the hole. To use the Saver Plug, you do not have to change **ANY** of your current drilling or blasting parameters.

6. **What type of explosives work with Saver Plug?**
   Any type of explosives work with this method of blasting; emulsion, dry powder – prilex etc.

7. **Does Saver Plug Improve Fragmentation?**
   Yes, it does improve fragmentation because the energy is contained in the ground for longer and is directed downward due to the air gap. The energy is thus distributed more efficiently.

8. **We have Water in the hole, will this impact our blast?**
   The Saver Plug is designed to penetrate water, and still creates an "Air Deck" – converted to hydraulic pressure due to the water – still saving 25Kg on a 165mm OD of explosives per hole. Some of our client have blast holes flooded to the top with water – plug still functional.

9. **Does Hole length have an impact on Saver Plugs and Blasting effectiveness?**
   Vertical hole of 36m is no problem, and will still yield a saving on explosives consumption. The deviation is overcome by "rodding" the plug to ensure it reaches the bottom of the blast hole. This method is typically used in "angled hole application" to ensure the plug reaches the bottom of the hole. Having said that, if the booster finds its way down, so then will the Saver Plug. The conical design of the Saver Plug is specifically designed to lessen the chance of getting stuck.

10. **We would like a demonstration, What is the process?**
    The process to conduct a trial blast, normally follows as per below:
    - The Client completes a Technical Data Sheet
    - 2 Boxes – +/- 210 units are air freighted to the client (this is done at Penhine's expense). The client then clears the goods through customs and transport the goods to the their site (Normally easier to clear from within the Country)
    - Whilst the goods are in transit, we arrange Visa/s, if required we will ask the client for a Letter of Invitation to assist with the visa process.
    - Travel and accommodation arrangement – (Where possible we will stay on the mine otherwise we ask the client to recommend accommodation in the area. We also ask that the client provide transport to and from the mine and accommodation.
    - Once the goods are on site, and you provide an estimate of when you have a block available to charge, I/we travel within a day or two or first available flight.
    - Once on site, I/we will conduct an introduction presentation, after which charging can commence. I/we will also require a planning sheet with your planned depths and explosives planned kilograms. I/We then give on site product and application training, starting with the application process, then hand over to the charging team to get a feel and complete the charging. I/We will be alongside them all the time.
    - During the above process, we measure actual vs planned depths, depth after inserting Saver Plug (to determine air-deck achieved, and ensuring plug reached the bottom of the hole), and explosives usage. Normally emulsion is still charged up to stemming height.
    - Stemming material needs to be available during the application process.
    - After the blast, we do a visual inspection after which the client will obviously do their own assessment.

11. **Will Air-Decking and or the Saver Plug methodology of blasting cause Ejections/Blow Outs and poor fragmentation?**

    The Saver Plug, or Air decking methodology for that matter, could NEVER or has never had an effect on ejections or blow outs. Blasting science over the past century proved that undoubtedly, as it of no consequence anyway during the whole process of blasting. Allow me to explain:

    Upon initiation of an explosive charge in a blasthole, a detonation wave travels through the explosive charge column. The velocity of detonation (VOD) is a function of explosive characteristics, confinement, and charge diameter. This high pressure wave causes expansion of the blasthole, crushing of the rock in the immediate vicinity, growth of cracks beyond the crushed zone, and generation of a seismic wave.

Ejections and flyrock is caused by a mismatch of the distribution of explosive energy, type of **confinement** of the explosive charge, and mechanical strength of the rock. Factors responsible for creating this mismatch include Insufficient or improper stemming leading to stemming ejection and bench-top flyrock. Stemming is the key variable to change the degree of the confinement.

Explosive energy utilization and control over fragment size can be achieved with the application of proper and sufficient stemming. ***The main objective of the stemming is to stem the explosive energy for such a time that the energy get migrated or transferred to rock mass for designated work of rock fracturing, fragmentation and displacement***. Premature ejection of the explosive energy through stemming column leads to ill effects of blasting such as fly rocks, air blasts and non-uniform fragments.

Proper utilization of the explosive energy shall also results into increased drilling pattern, reduction in the cost of secondary breaking and handling of rock. The primary benefit of adequate stemming of a blast hole is improvement in the duration of the explosive energy to work more upon the surrounding rock mass. This phenomenon of higher retention time not only improves fragmentation but also assists in eliminating or reducing unwanted or ill effects of blasting like air blasts and fly rocks.

The combined effects of the higher retention time and the lower stemming ejection velocity will also manifests into a larger component of the explosive energy available for rock breakage and thus better fragmentation is resulted which assists into safer, economical transport and milling process.

Improvement in the retention time substantially reduces the stemming ejection velocity, thereby, reduces chances of fly rocks and blow outs.

Insufficient stemming lead to premature venting (Blow Outs) off of the explosive energy while excessive stemming results into boulders formation from the stemming column zone.

12. **At what temperatures will the Saver Plug operate?**
    The product is designed to withstand all applicable forces and temperatures ranging from +103°C to – 35°C.

13. **Where is Saver Plug Manufactured?**
    Saver Plug is manufactured in South Africa.

14. **Are Saver Plugs Hazardous in any way or form?**
    The product has been tested and is not hazardous in any way. It does not require any labels to be compliant to any of the EC directors or in terms of any other National Laws.
    It does not require any special handling or legal permits.

15. **Packaging and Number of Units in a box.**
    Saver plugs are shipped in boxes: