The Product:

Nitro Sibir Australia (NSA) manufactures Python Maxisplit as part of its commercial explosives product range. Python Maxisplit is a packaged presplit product designed for smooth wall blasting application. Python Maxisplit is manufactured in NSA's purpose built presplit manufacturing facility in Kalgoorlie, Western Australia.

The Python Maxisplit design consists of a continuous casing film that is filled with a high energy watergel explosive, clipped at 400mm intervals creating individual chubs. The entire length is centre traced with a 10 gram detonating cord initiation system. An annotated design is displayed in Figure 1 and the actual product is displayed in Figure 2.
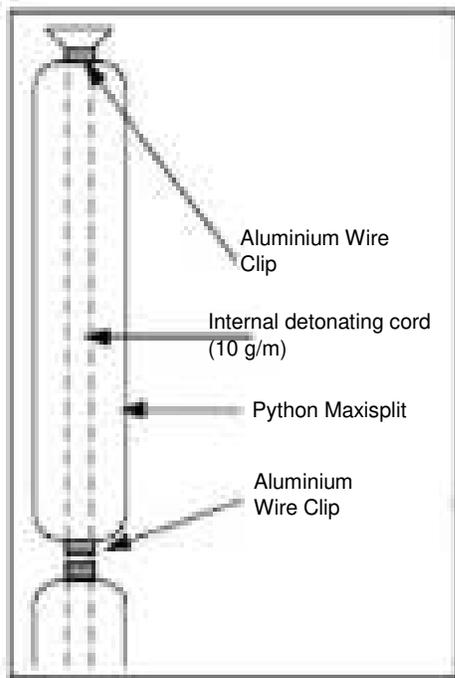

Figure 2 Example of Presplit Smooth Wall

Figure 1 Annotated Diagram of Python Maxisplit Design

The chemical composition of the watergel explosive used in the Python Maxisplit has been designed to target maximum delivery of explosive pressure to the wall of the presplit blast hole. Using industry specialists in explosives chemistry and explosives application, NSA has been able to deliver a packaged presplit explosive that has significantly greater energy than equivalent sized emulsion and other watergel based presplit explosives. These products are used in the Australian mining, quarry and construction blasting industries. Anecdotal field test results, from multiple mine sites, have proven that the Python Maxisplit will deliver a smoother wall (safer to work under) than comparative products. Alternately the same result can be achieved by using less explosives through expanding the presplit blast hole spacing.

In addition to the high energy watergel formulation, Python Maxisplit has been designed toreliably initiate in tough conditions by improving the sensitivity of the explosive through the addition of glass micro balloons (GMB's).

Aluminium is also added to increase energy and sensitivity, and produces a longer duration high pressure gas flow to maximise the work that the Python Maxisplit delivers to the presplit crack formation.

NSA offers this fit for purpose explosive, Python Maxisplit, in 3 standard diameters, 26 mm, 32 mm and 38 mm. Additionally, a custom configured product can be supplied that is designed to suit any particular site application. The custom-made product includes delivering a product that is ready to apply directly into the blast hole, out of the box. Customising of the Python Maxisplit includes provision for uncharged collar length, the doubling over of chubs at the bottom of the blast hole and the attaching of rope to suspend the product in the blast hole. The customised product improves manual handling of the explosive, less bending means improved ergonomics and elimination of cutting and splicing in the field means much quicker charge up times. As the customised product is completed at the point of manufacture to the customer's specification, the quality and consistency of the product loaded into the hole is of a much higher standard than field assembled presplit strings. NSA understand that one product and one configuration of the product will not deliver an optimal result for all product users.

The Problem:

A large gold mine in the South West of Western Australia required smooth wall blasting. It made good use of presplit blasting techniques to produce stable steep walls thus achieving economic extraction of the low-grade gold deposit.

Within a year of commencement of mining at the site, the process of evaluating presplit blast parameters to achieve a smooth wall finish began. Through trial and error of the available hole diameters, the available packaged presplit products, bench heights and hole angles, different blasting scenarios were tested and evaluated.

A workable result was achieved, producing very consistent residual half barrels on the walls. However, this result was not considered an optimal as there was still loose rock in places between the presplit barrels. The lumps of rock between the half barrels were considered potential rock fall hazards, that could injure employees working below. Figure 2 displays the typical wall conditions using an emulsion based packaged presplit product.

Figure 3 Presplit Results Using Emulsion based Presplit

For the site to improve the results using an emulsion based packaged presplit, the costs were prohibitive - smaller blast holes, more blast holes, more drill rigs and more explosives would be required. The site started to enquire about alternative products and suppliers to improve the current results, without having to change the site's current blast parameters.

The Solution:

The Python Maxisplit high energy packaged presplit product was delivered to site late in 2012. Upon excavating the first trial blast the client was immediately convinced of the benefits of using the new formulation.

The presplit walls went from being lumpy to achieving a smooth wall finish. All of the blast parameters remained the same, with the only change being the higher energy watergel formulation. Figure 3 displays the results that are being achieved using the Python Maxisplit presplit explosive product.

Figure 4 Python Maxisplit Smooth Wall Results

The Benefit:

The site was able to realise the following benefits by using the Python Maxisplit packaged presplit explosives:

- Achieve smoother wall surface with minimal to no rock fall hazards;
- Achieve design wall surface at lower explosives cost, compared to competitor products;
- Reduced the clients drilling costs to achieve smooth wall finish compared when using other products;
- Improved presplit loading rates using the custom-made product manufactured to the sites requirements;
- Improved safety with no cutting, taping, securing rope to product required to occur when loading on bench;
- Steeper final walls.

After 3 years of using the Python Maxisplit, the large-scale gold mine has locked in both safety and economic benefits by using an explosive product that is tailor made to the site's requirements. NSA also offers a continuous improvement service where they will work with individual clients to provide a product that is suited to their specific sites ground condition and blast parameters. The tailor-made product may include variations in explosive strength, diameter and explosive charge length – client input is vital in arriving at the ultimate product configuration.

Disclaimer: This case study is based on factual evidence, Nitro Sibir Australia (NSA) provides no implied warranty or guarantee of performance.