

## Nxburst™ in Underground Mining

*How long does your mine sit idle waiting for clean air?*

*Would you like to deal with any oversize in the drift and not tying up machinery stockpiling it?*

*How much does dilution rob your bottom line?*

*How much does the blasting schedule hold back your personnel?*

Could you find efficiencies through on-shift blasting? Is there a way to make things faster, safer and in turn more profitable? It's hard to gauge the impacts of the questions I asked above without looking at the biggest possible picture, understanding the interconnections of different processes, machinery and personnel within a mine. In the quarrying world Nxburst can be as much as twice the cost of high explosives, so why is it used more and more in surface quarries as the primary blasting agent? Simple, formation recovery, when more finished product is created and all the costs and impacts are considered the operation is further ahead.

### *Nxburst™ provides value.*

So where do you find the value in an underground application? Have any of the earlier questions been a thorn in the side of your operations? Nxburst™ cartridges give a mine the ability to blast on shift, with oxygen-balanced cartridges that allow for re-entry times of minutes not hours, high explosives could only dream of that. Without a damaging shockwave over-break is 100% controllable improving hanging wall conditions and reducing scaling efforts. With high frequency, short duration vibration created, existing mine infrastructure is safe from blasting effects allowing for improvements in traffic flow and upgrades in the mine. Nxburst™ has been used with advantages like the ones listed below:

- The ability to blast all the oversize at the source or off in an unused area
- Slying and general mine improvements around existing infrastructure
- Drift development where surface vibrations are a problem
- Reduced dilution in precious metals mining
- Elimination of the crush zone greatly reducing dust and fines
- A lack of flyrock leads to a reduction in the required safe zone and mine interruption



When your whole operation is chasing 4 grams per tonne or 0.000004% of total ore extracted and a minimum cutoff of 2 grams per tonne, every small gain makes a big difference. Can you afford to keep your blinders on to possible gains that Nxburst™ will give you?

## No Noxious Gases

When used properly the Nxburst™ cartridge is oxygen balanced so that sufficient oxygen is available for the chemical reaction to achieve optimal oxidation to produce gases consisting of carbon dioxide, nitrogen and steam and thus avoiding the production of noxious gases such as carbon monoxide and nitrous fumes.

The efficient ignition of the Nxburst™ propellant mixture is represented in the generic formula:



**Nitrocellulose + ammonium nitrate (oxidizer) → steam + nitrogen + carbon dioxide + energy**

**(X) C6 N3 H7 O11 + (Y) NH4NO3 H2O + N2 + CO2 + energy (joules)**

In addition, the quantity of propellant in a Nxburst™ cartridge used to break rock is less than the comparable quantity of explosives that is historically used to break the same amount of rock by a factor of six. A single 180 gram Nxburst™ cartridge can be used in a 1.2 metre long hole, to break a 500mm burden in most rock types; compared to a 1.1kg charge of ANFO that is commonly used for the same application. The reduced quantities of propellant required to break the rock compared to explosives means that considerably less fumes are emitted by the rock breaking event.

As a result of the degree of oxidation achieved in the deflagration process, through the incorporation of an effective oxidizing agent and the relatively small amount of propellant used in each hole, the Nxburst™ cartridge produces a negligible level of noxious gases which are cleared in minutes when an adequate standard of airflow (nominally a velocity of 0.25 meters per second) is available.

Coogar Sales & Services is the proud distributor of Nxco's **Nxburst™** and **Fragmentor™** throughout Canada, US and Mexico as well as the full line of MacLean Engineering's **MDA Rock Drills** and the **QuikDraw Mine Hang-up Relief System**. With our staff having a practical drill and blast experience we can guide you through even the most delicate of jobs safely and effectively helping you and your bottom line.

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