

Nxco Rock Breaking Cartridges (Nxco RBC's)

I would like to use this opportunity to present you with more information about our company and products.

1. Introduction

Nxco Mining Technologies (Pty) Ltd is a Level 2 BBBEE South African based company that manufactures and distributes non-detonating cartridges throughout the world.

Our cartridges have been tested by UN accredited testing company – TEN E Packaging, NRCAN, Bureau Veritas in France, BAM in Germany for CE accreditation and these tests have been accepted by every country that we sell our cartridges in.

2. Comparison

The most significant difference between Nxco RBC's and explosives are the following:

- Nonex cartridges deflagrate, unlike conventional explosives that detonate.
- They also break rock on tensile strength rather than compressive strength.

These 2 fundamental differences offer significant advantages when using our cartridges. In sensitive blasting environments where the use of High Explosives is restricted or prohibited.

3. The advantages of Nxco RBC's

3.1 Energy

Nxco RBC's have low energy when compared to high explosives. This is because the speed of deflagration is significantly lower than the velocity of detonation (VOD) typically associated with conventional explosives that exceed 3500m/s.

Due to the above, there is minimal vibration when using our products (this has been tested and proven on many occasions) and it allows our product to be used close to green cement, busy roads, personnel, expensive equipment and sensitive structures/facilities.

For the reasons stated above, Fly-rock is therefore 100% controllable.

3.2 Environmental Impact and Sensitivity

Dust and Noise levels are significantly lower than conventional explosives.

When breaking rock towards a free face, the back break or damage to adjacent rock is non-existent.

3.3 Flexibility

Rock Breaking Cartridges only break the rock according to the designed drill and blast pattern.

- It also allows you to plan the breaking in stages if necessary.

- The Nonex RBC solution is effective and safe.

3.4 Safety Distances

One of the major advantages of Nonex RBC's is that your safety distances for personnel and equipment are approximately 50 metres if no coverage are used. This means that personnel and equipment only require local clearance instead of complete site evacuation. The benefit of this is that rocks and boulders can be broken in shift and close to working operations.

3.5 Training and Accreditation

To become an accredited Nonex blaster one needs to undergo our training course which includes a theoretical and practical aspect followed by a written exam.

Following the successful completion of the training course, the trainee will be issued a Nxco competency certificate.

More detail on training will be provided closer to the start of the project. (this is dependent on the type of operation and regulators involved with the project, as well as previous experience and certification of the blasters recruited for the project).

3.6 Safety

Inherent safety characteristics are:

1. Minimal fly rock.
2. Absence of detonation eliminates ultra-fine particles from being produced thus less dust is generated and the dust settles fast.
3. The product produces low noise levels and most of the noise is generated when the rock fractures. Measured levels are about 116dB compared to explosives above 154dB at 30m.
4. Vibrations are very dependent on soil conditions and rock strata. As a rule, Nxco RBC's generate around 1,3 – 5,9mm/s at 10m compared to explosives that frequently exceed 30mm/s. With our sequential timing system, Nxco can meet all international vibration standards.

4. Product range

Stemmed cartridges

13mm (5-10 grams)
 28mm (20 - 120grams)
 34mm (40 – 250grams)
 42mm (60 – 650grams)
 60mm (200 – 500grams)
 90mm (2000 – 4000grams)

Self stemming cartridges

Concentric case 43mm (140-220grams)
 Axial Piston 43mm (80 – 240grams)

This range allows the contractor to tackle virtually any rock or concrete breaking project/application

5. Various Applications

The applications of RBC's include:

1. **Any sensitive in-situ rock** (found in gardens, commercial & industrial areas and environmentally sensitive situations).
2. **Mass excavations** – any mass rock excavation project that is sensitive in any way or is near busy roads, structures, gas or water pipelines or in a built-up area.
3. **Oversize boulders** (above and underground – with Nxco RBC's, these can always be broken in shift).
4. **Breaking down or demolition of concrete and reinforced concrete structures** (i.e. concrete bases, harbour coping, thick reinforced walls. etc).
5. **Trenching applications:**
 - **Pipelines,**
 - **Harbour deepening projects,**
 - **Tunnelling** (almost all secondary work should be carried out by Nxco RBC's as it can be done during shift and it leaves a more competent finish), and
 - **Pipe jacking.**

6. References

Nonex cartridges have been used for various important projects around the world.

Some of these include:

1. Removal of a pier in Galveston, Texas, for the national railway corporation.
2. Removal of rocks displaced by the earthquake in Christchurch, New Zealand.
3. General rock removal is done of the underground railway service in Singapore.
4. Removal of a harbour quay in Durban, South Africa.
5. Mass excavation of rock at Kusile Power Station in South Africa.
6. Creation of the box cuts for the Gautrain underground high-speed train service in Johannesburg, South Africa
7. Parliament building tunnel Ontario Canada
8. West Wits mining of gold
9. Sogima Mine 11m bench in Chrome ore
10. In shift oversize blasting at Tharisa Mine