

AutoStem Generation 3

Patent protected

June 2023



The reinvention of explosives

*9mm – 87mm range of non-detonating blasting
cartridges*

Dual-Stemming™

Safety Lock™

AutoStem™ sequential

Waterproof

www.autostemtechnology.com

AutoStem range is first viable **non-explosive** blasting technology

- A fundamentally differentiated blasting category
- No shock combined with high energy delivery, classified as 1,4S
- Cartridge products suitable for all borehole sizes from 9mm – 103mm
- Significant factors leading to adoption include:
 - Classification: Benefits from 1,4S accreditation in transport, storage and use
 - Legislation shifts: No mass detonation hazard or malicious application favours non-explosive solutions in sensitive blasting and/or built-up areas
 - Productivity: Avoided shock means minimal scatter rock, no site downtime, immediate re-entry
 - Cost effectiveness: Lower than the cost of a detonator
 - Safety: 1,4s accredited. No deflagration without confinement. World's first safety switch in Gen III
- AutoStem is more suited for civils blasting than conventional detonating explosives, particularly where vibration effects are of a concern

Non-detonating Solutions (Pty) Ltd – Advanced non-detonating technology

- Company formed in 1997
- Introduced multiple products since 1999
- 2011 breakthrough: AutoStem Technology
- World's first viable alternative to conventional explosives
- Led to a refocus of business activities in Research and Development of AutoStem Products
- Production out of South Africa, currently setting up facilities in 3 new locations
- Multiple patents granted internationally
- Since introducing the AutoStem range in 2015, we now supply product to over 40 countries
- Wide variety of customers and blasting applications

AutoStem design objectives

- More power: Increase energy capacity, not VOD
- No shock energy: Reduce VOD (“velocity of detonation”). No detonation.
- Energy conversion: Delivery to rock
- Safety paradigm: No malicious application, safe unless initiated in borehole
- Predetermined fragmentation Cartridge for every application and requirement

RESULTS:

- Improved upon the energy released in the chemical reaction (ΔH_f)
- Proven the decoupling of variables VOD and ΔH_f
- Self-stemming – the only blasting technology which requires no stemming in the world
- Very safe in that AutoStem cannot be deflagrated outside a confined borehole
- Wide range of cartridge diameters, lengths and cartridge choices in terms of energetic masses

	AutoStem Gen III	Conventional packaged product
TNT equivalent	1.1x	0.8x
Strength relative to ANFO	c. 1.5x	1.0 – 1.1x
Velocity of deflagration	360 m/s	5,000 m/s
Heat of combustion (Celsius)	2,500	3,000
Vibration at 10m	Highly controllable (< 2.5 mm/s)	Significant

Generation III... 2017 launch

- Highest power non-detonating (non-explosive) ever designed and manufactured
- Dual-stemming, Safety lock feature, water proof
- Does not require explosive accessories to be initiated
- Cartridges from 3g to 1,700g
- Diameters from 9mm – 87mm and larger
- Widest range of blasting cartridges
- Can be initiated with/without detonators



AutoStem Micro The **smallest** range of **blasting cartridges**

- The smallest range of blasting products ever
- 9mm suitable for 10mm holes: Power charges from 3g
- 16mm suitable for up to 20mm holes: Power charges from 15g
- No measurable vibration output
- Suitable for all types of concrete breaking, sensitive rock breaking, small boulder blasting, in-crusher blasting
- Drilling can be done with a hand-held electric drill
- No compressor, rock drill, diesel, air-hoses required



Seen as “**Future of explosives**”... (Economist, 2015)

Patents and accreditations

- Dual accreditation (Pyrotechnic and Cartridge, power device)
 - Europe (CE Mark of approval)
 - USA (Department of Transport)
 - Canada (Ministry of Environment)
 - South Africa (South African Police Services)
 - Australia (State Ministry of Mines)
 - Chile (classified outside of explosive class)
- Few explosive products have global approval status or similar regulatory endorsements
- **Tecnocom** are official distributors of AutoStem products in **Italy**



Profiled in “Global Trends”.. A series produced by the BKT Network in May 2023



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