

Miners to breathe easier with non-toxic explosives

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Credit: AI-generated image ([disclaimer](#))

Fume resistant mining explosives research may soon offer resource companies a safer alternative for workers as well as a bigger bang for their buck.

Toxic gas plumes generated from blasting explosives remain a key safety

concern for the industry and cost Australian mining companies tens of millions of dollars each year implementing strict and onerous safety and productivity control measures.

Blasting can produce varying levels of carbon monoxide and the oxides of nitrogen (NO_x), which can be extremely harmful if people breath in the fumes.

Techniques to protect workers from the [toxic fumes](#) of conventional explosives are governed by strict blasting guidelines, including large area exclusion zones.

In an effort to tackle the problem global explosives manufacturer Dyno Nobel (DN) has joined forces with Murdoch University to investigate ways to reduce the toxic gas emissions and develop fume resistant explosives for critical areas.

The study's chief investigator Professor Bogdan Dlugogorski says Australia needs to remain at the forefront of mining safety because the mining industry is a major contributor to the nation's economy.

"The aim of the current project is to try and produce explosives that are intrinsically safe and cannot produce NO_x under any circumstances," Prof Dlugogorski says.

"A small exposure to the toxic fumes can affect the lung function with the safe limit about 40 parts per billion.

"However toxicity measurements in some plumes have recorded 500 parts per million (ppm), which is about ten thousand times more than the safe limit."

Prof Dlugogorski says the research team is tweaking the formulation of

explosives.

"In the past we worked with DN on the formation of NO_x during sensitisation [making them capable of detonating] of the explosives and the second stage of the project was dealing with NO_x in the detonation of the explosives," Prof Dlugogorski says.

Their latest project involves making the explosives in such a way that when detonated it will fracture rock as well as heave it so that it is easier to move post blast.

Dyno Nobel Asia Pacific senior vice president Rob Rounsley says post-blast NO_x free explosives will have applications worldwide, particularly in the coal mining industry where the problem is most prevalent.

"Once mines have certainty that the post-blast conditions will be free of NO_x toxicity they will be...free to do larger blasts using smaller exclusion zones," Mr Rounsley says.

"This will potentially cut down on other costly risk management measures associated with large exclusion zones, such as blocking roads and obtaining permissions, which will increase a mine site's productivity considerably," he says.

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