

# THE AUSTIN ADVANTAGE

REDUCTION OF GROUND  
VIBRATIONS BY 14% WITH  
BLAST SIZE INCREASE BY  
300%



## GENERAL INFORMATION

**Location:** Czech Republic, Central Bohemia

**Project Type:** Surface Limestone Quarry

**Products Used:**

- E\*STAR
- Emulex 1
- Paradigm Software

**Project Leads:** Blaha Milan, Jakub Srek

**Authors:** Vojtech "VJ" Kala, Pavel Krivanek, Josef Stavinoha

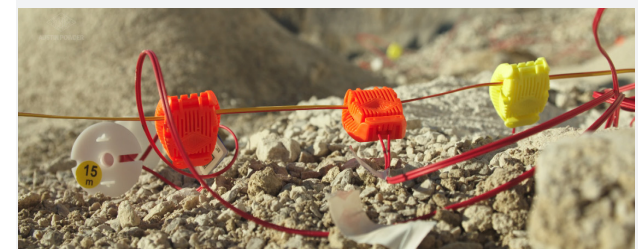
## THE HISTORY

The production at the quarry started in 1950. Since that, limestone has been exploited from the quarry on a regular basis. With two interconnected pits (eastern and western) and 1,800,000 tons / year it is one of the biggest quarries in Czech Republic.

The most pressing issues for this quarry was historical caves in close proximity of the western pit. Until 2011, only nonelectric detonators were used in this pit, from 2012 to 2014 E\*STAR detonators were used without the modeling, and since 2015 E\*STAR detonators with Blasting Solutions and later Paradigm modeling was used for all blasting works in the western pit.

## THE GOAL

1. The main goal was to make vibration results more constant and to keep them below the quarry comfort zone (3 mm/s), which means to protect the caves.



## THE CHALLENGES

Nonelectric blasts were generating unpredictable vibrations with big value spread. When blasting operations get closer, vibrations get higher, and spread gets bigger. Typical blast parameters are: hole length from 15 to 20 m, hole diameter 92 mm, burden 3.3 m and spacing 2.9 m, charge weight might be max. 27 kg per deck. Request is lowest vibration inside the caves – close to stalagmite.

## THE AUSTIN SOLUTION

By living our values every day at Austin Powder, we focus on continuous improvement and innovation for our customers. In this study, every blast in the western pit was run through Paradigm modeling software analysis. The results from the analysis provide the best hole-to-hole, row-to-row, and deck-to-deck delay. Only this procedure can guarantee the lowest possible vibrations inside the caves and ensure its protection.

## THE OUTCOME

Using E\*STAR electronic detonators with Paradigm modeling reduced vibrations and decreased the spread of values.

Average blast vibration reduction is around 14% with 300% blast size increase. Maximum charge per delay interval was increased by 100%.

**14%**

Blast vibration reduction

**300%**

Blast size increase

**100%**

Maximum charge-per-delay increase



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