

Shotcrete Advanced Technology: ChemSave and QuickScan

OUR COMMITMENT TO MINING SAFETY AND PRODUCTIVITY RUNS DEEP.

CANADA | USA | MEXICO | PERU | SOUTH AFRICA | AUSTRALIA

macleanengineering.com

 **MacLean**
Performance. Reliability. Innovation.

ChemSave: The MacLean solution for total shotcrete savings



- Reduces the amount of chemical required for the same amount of shotcrete, while producing an optimized, more refined product.
- Better atomization of the accelerant chemical to provide quicker & better bonding with the cementitious particles, decreasing the reaction time needed to hydrate the batched material.
- Allows for the reduction of shotcrete material required for the same job, due to better material properties.
- Improved rebound reduction, from 15% rebound on average to less than 5% due to optimized batching and curing.
- Reduced re-entry times for in-cycle shotcrete due to improved performance of the shot material.
- The science behind the principles of ChemSave, allows for a better final product, in-less time, with less base materials.

Experience all the downstream savings by spraying an optimized, more refined product!



The Data: Trial Results

End Beam Testing

- Improved early strength development achieved at nearly half the accelerator.
- Exceeds *J3 curve in Austrian guidelines for sprayed concrete, which is typically not required and indicates cement savings can be achieved.
- Final strength exceeded target by greater than 25 Megapascal (MPa), resulting in a less elastic or more brittle material that wasn't specified by geotechnical engineering.

* J-curves represent widely accepted baseline models for the early age strength development for sprayed concrete.

Penetrometer Testing

- Near identical 24-hour strengths between ChemSave prototypes.
- Significant difference in early strength generation between prototypes allow for homing in of the final design.
- For in-cycle shotcrete, re-entry time of about 20 minutes is possible WITHOUT overdosing the shotcrete, compared to the conventional 1-2 hours.

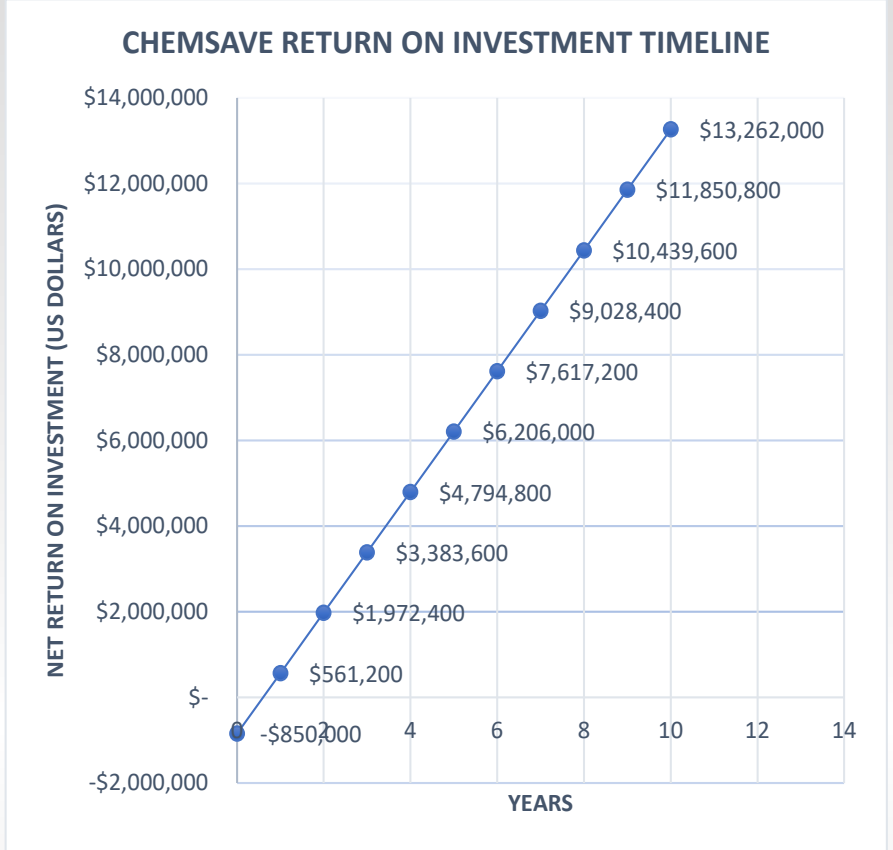


ChemSave Savings Estimation

See how ChemSave can bring you savings, regardless of your current output or usage levels.

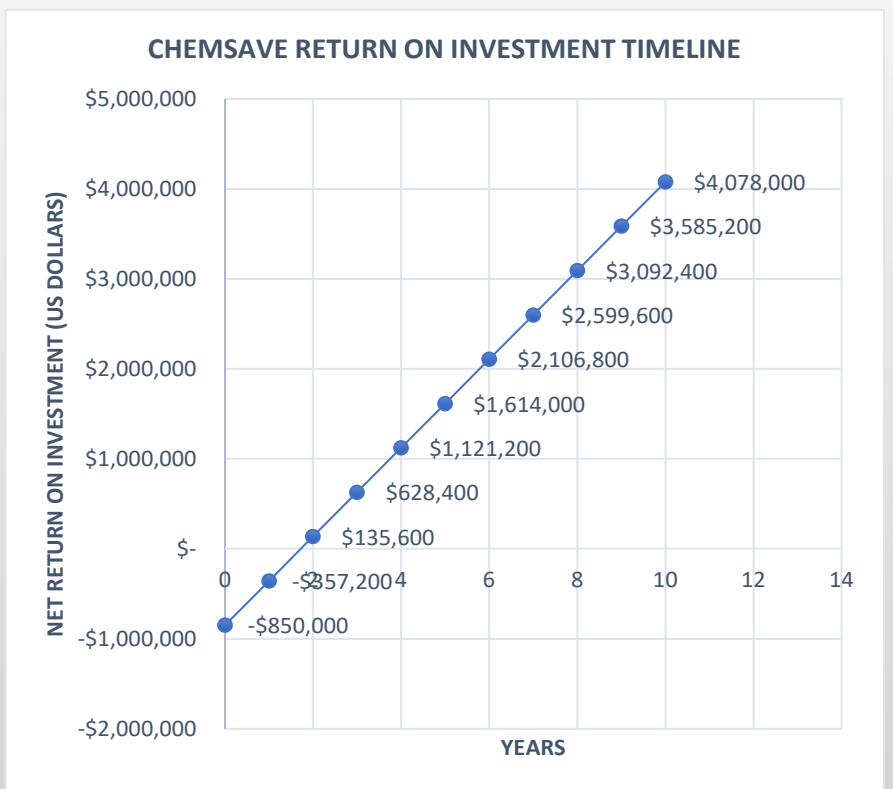
SCENARIO #1: High Output Scenario, Significant Spraying Volume Requirements

ASSUMPTIONS	
Current accelerant dosing	7%
Shotcrete used per shift	50 m ³
Operating Days	315
Shifts per day	2
Price per 2000L Chemical Tote	\$2560 USD
RESULTS	
Chemical Savings	50%
Chemical Savings per m ³	35 L
Chemical Savings per shift	1750 L
Chemical Savings per year	1102500 L
Cost Savings per m ³	\$44.80 USD
Cost Savings per shift	\$2240 USD
Cost Savings per year	\$1411200 USD
Repayment of Machine Timeline	0.6 YEARS
Return on Investment over 5 Years	730%



SCENARIO #2: Lower Output Scenario, Fair Spraying Volume Requirements

ASSUMPTIONS	
Current accelerant dosing	7%
Shotcrete used per shift	25 m ³
Operating Days	220
Shifts per day	2
Price per 2000L Chemical Tote	\$2560 USD
RESULTS	
Chemical Savings	50%
Chemical Savings per m ³	35 L
Chemical Savings per shift	875 L
Chemical Savings per year	385000 L
Cost Savings per m ³	\$44.80 USD
Cost Savings per shift	\$1120 USD
Cost Savings per year	\$492800 USD
Repayment of Machine Timeline	1.7 YEARS
Return on Investment over 5 Years	190%

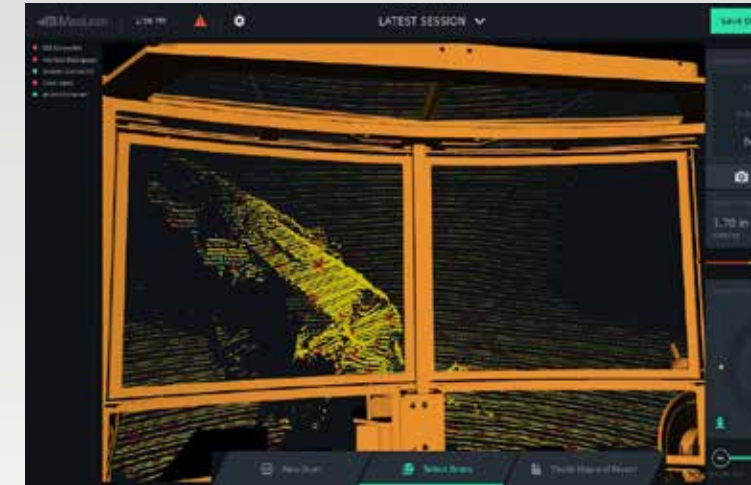
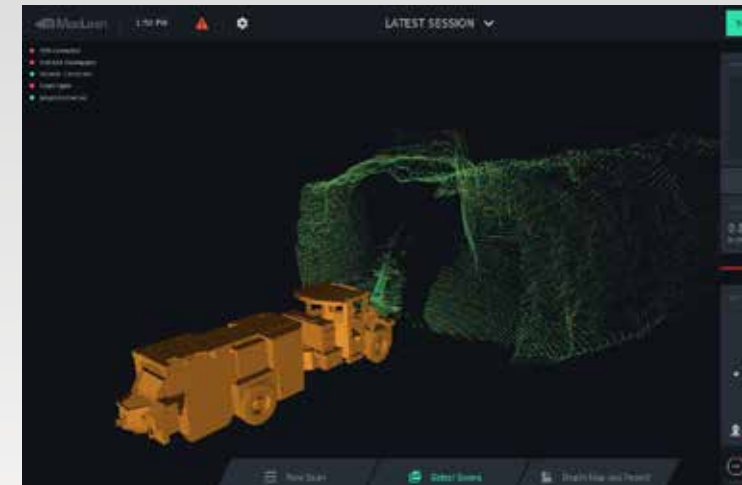




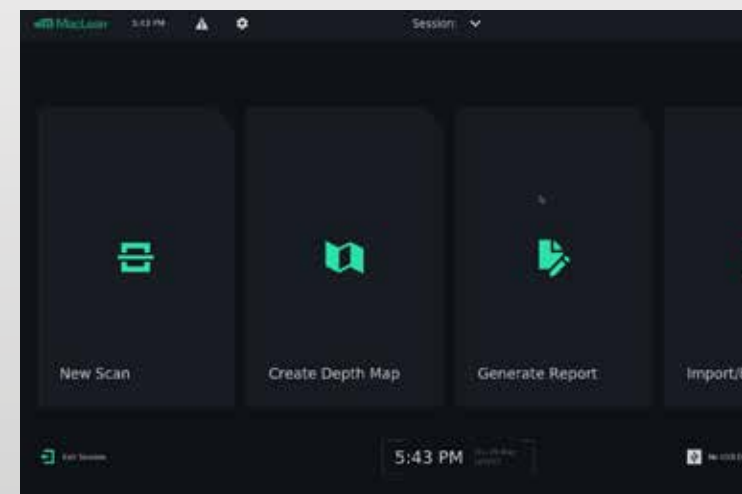
QuickScan

Improving the efficiency of shotcrete application

Real-time shotcrete thickness scanning



- Rapid shotcrete thickness scanning onboard.
- The QuickScan system provides the operator the ability to easily assess, visualize, and report the progress of spraying shotcrete in real-time during the spray session.
- Over usage of shotcrete material eliminated while meeting the ground support specifications provided to the machine operator.
- QuickScan also offers compatibility with Deswik mine software, providing the ability for file scans and geo-referencing integration.



SERVICE. SUPPORT.

The MacLean Way. 

WHEN YOU BUY A MACLEAN MINING VEHICLE, YOU ARE FAMILY.

We care that our products and technologies enhance life above ground and below. Whether it's increased safety and productivity, or quieter, more ergonomic, zero emissions operations - our products make a real difference in the world. We back this up with a global branch infrastructure and technical support, field mechanics, and trainers. The result: increased machine productivity and operator safety and a lower Total Cost of Machine Ownership (TCO) for you.

To learn more, reach us at: info@macleanengineering.com



OUR COMMITMENT TO MINING SAFETY AND PRODUCTIVITY RUNS DEEP.

CANADA | USA | MEXICO | PERU | SOUTH AFRICA | AUSTRALIA

macleanengineering.com

 **MacLean**
Performance. Reliability. Innovation.