

*Your Success is Our Real Measure*

## *CEMIS Solutions - Advanced Cover Structures for Mine Tailings*

CEMIS - the Centre for Measurement and Information Systems is a contract-based joint centre of the Universities of Oulu and Jyväskylä, Kajaani University of Applied Sciences, VTT Technical Research Centre of Finland and CSC - IT Centre for Science. CEMIS specialises in research and training in the field of measurement and information systems.

Our focus is to develop measurement and IT solutions for cleantech sector and for sports, wellbeing and healthcare, and to support the development of new international business based on our innovations and expertise with our partner companies. In cleantech, we have a strong expertise in on-line measurements for process industry, especially for bioeconomy and mining sector and in environmental monitoring. In sports, wellbeing and healthcare we work with the latest sensor technology and game and simulation solutions including virtual and augmented reality.

### CEMIS offering for mining companies and organizations:

Custom made solutions for tailings pond problems in mining sites.

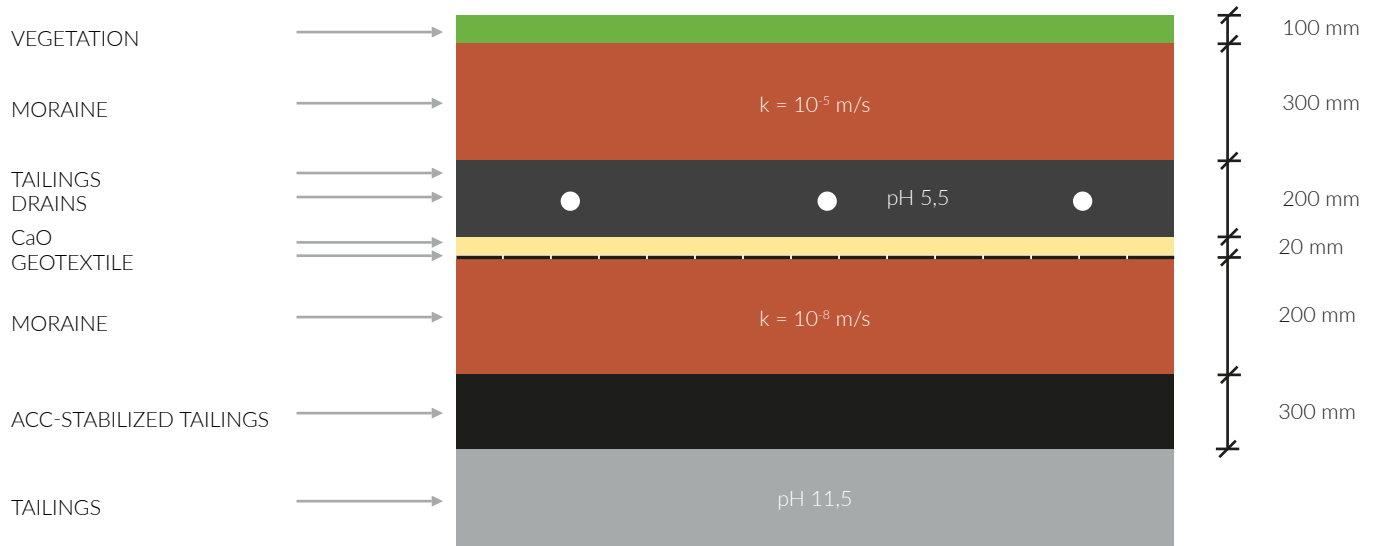
Advanced hardpan cover liner (AHCL) is a new structure model for the environmental protection purposes of the mining industry.

Other new solutions upcoming for using recycled materials in infrastructural and environmental construction.

### Advantages and benefits of AHCL:

- The advanced hardpan cover liner (AHCL) is a better option for a cover structure in a tailings pond than a moraine cover or simple ash/slag cover or stabilization solutions, making it a superior alternative.
- AHCL is a cost-effective and durable option especially in countries and sites, where sites are remote and labour is cheap. The hardpan layer solidifies faster in warm climate conditions.
- AHCL double structure gives better protection against erosion.
- In addition, the double structure gives a more secure protection regarding hydraulic and oxygen conductivity than simple cover structures.
- The AHCL has been tested in laboratory and on site in Pyhäsalmi mine in Finland.

## A Construction Example-Advanced Hardpan Cover Liner (AHCL)



## CEMIS Material Research for Mining Industry

Mining and traffic infrastructures require new environmentally friendly, durable materials and structural solutions combined with energy efficient processing methods. Considerable unexploited opportunity exists in the recycling and reuses of industrial side flows, for example in mine landfill, protection and cover structures.

CEMIS aim is to improve material efficiency and to decrease waste by increasing the quality of processed waste. Our research and development has created a number of innovative solutions in the field.

CEMIS helps mining companies through improving their processes, efficiency and safety through innovative measurement, material and information systems for various

needs. Our advantage is in the possibility to create novel solutions by combining the expertise of the various research units of CEMIS. In cleantech, we have a strong expertise in on-line measurements for process industry, especially for bioeconomy and mining sector and in environmental monitoring.

For more information contact:

### Business development and international connections

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## CEMIS - Centre for Measurement and Information Systems

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CEMIS employs around 100 measurement and information system experts. The centre's annual funding is over € 10 million.

CEMIS offer a wide array of services to companies and research institutions. CEMIS services include research and development services, analysis and testing services, device development services as well as business development services.

## The strategic focus areas of CEMIS are:

ON-LINE  
MEASUREMENTS  
FOR CLEANTECH

SPORTS, WELLBEING  
AND HEALTHCARE  
MEASUREMENTS

INTERNATIONAL  
TECHNOLOGY  
BUSINESS  
DEVELOPMENT

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