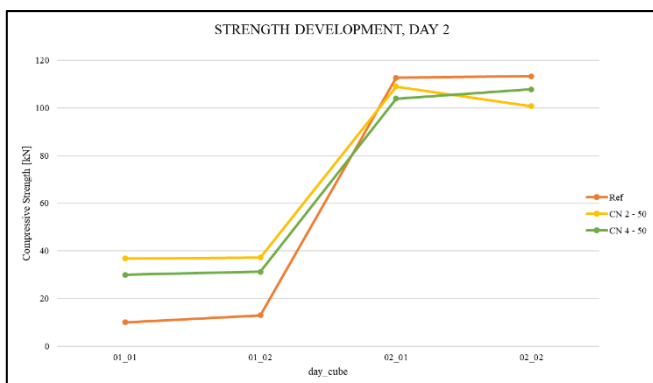


NTNU Students Presents New Results of Concrete Admixture – Potentially Making it Easier for Workers Dealing with Constructions in Cold Climates.

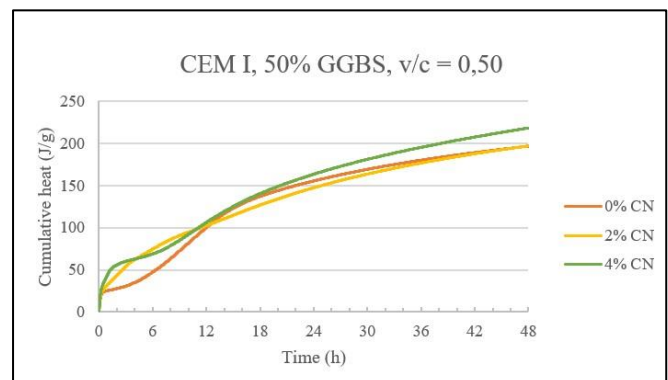
On Monday, 22.05.2023, three NTNU students presented new and promising results for Yara's concrete admixture NitCal. The new research shows high early strength of concrete when using Yara's admixture, thus creating a baseline for further development of the product. The new discovery can potentially create a much simpler construction process for workers dealing with curing concrete in cold climates.

The product, which has been on the market a for a while now, has prior to this not showed as high early strength. As concrete needs to reach a certain level of strength before removing the framework, a higher early strength can therefore shorten the construction time.

“The whole process has been very exciting. Especially when receiving such interesting results in the early test days” civil engineering student Margrethe Munch-Ellingsen says. As shown in the figure below, the NitCal infused concrete (yellow and green line) is stronger on day 1 compared to the reference sample (orange).



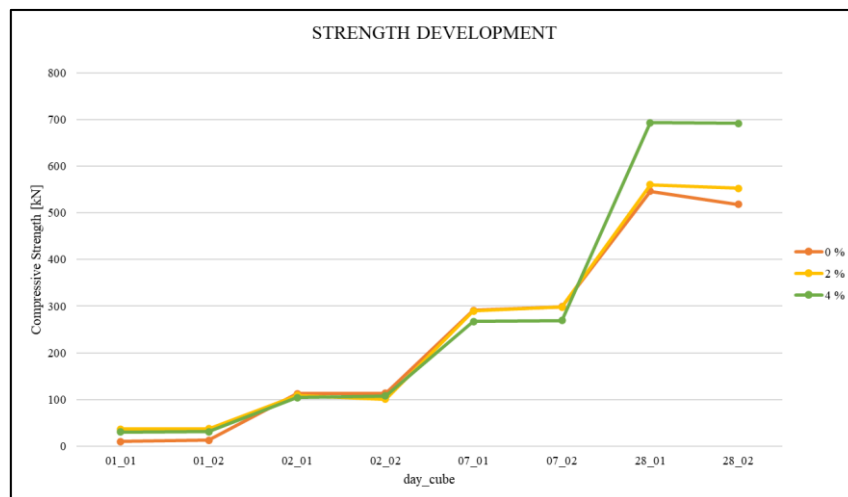
Compressive Strength on Day 1 and 2



Cumulative Heat, 48h

Yara's product was created to keep the temperature of the concrete at an acceptable level in extreme cold temperatures. The established methods for cold weather concreting are costly and time consuming, which leaves the construction industry hungry for alternatives. If NitCal gets established as a frequently used concrete setting accelerator, it can remove a lot of the heavy manual labour.

The students compared the results of three different tests when measuring the admixture's effect. "When approaching the research, we decided to cast three samples in each set, all containing different percentages of NitCal. This made comparing the effect quite intuitive" Aleksandra Marie Høye explains. However, not all results could be used due to the freezer malfunctioning.



Compressive Strength, 28d

By day 28 the compressive strength samples had cured in 32°C, and were no longer viable. "Errors do happen, all we could do was keep on going. We just hope our early strength results can be an asset to Yara, and help them further develop their product!" Elise Marie Rong Anfinssen says with a smile. The research was conducted as a part of the student's bachelor thesis at the Norwegian University of Science and Technology, they kept a close cooperation with Yara throughout the process.

