FIRST EXPERIENCES WITH FUTURECEM IN RMC

At the beginning of 2021, Aalborg Portland began deliveries of the newly developed cement, which has up to 30 % lower CO_2 footprint than traditional cement. Unicon already has several years of experience with the product.

By Birgitte T. Henriksen

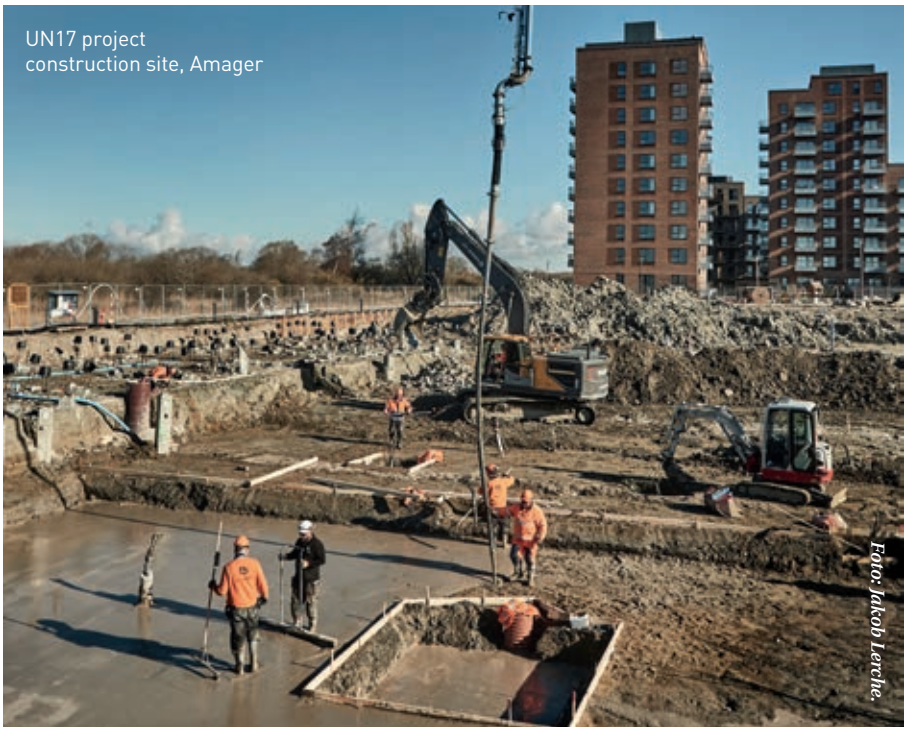
FUTURECEM is - as the first cement in Denmark - developed to reduce CO_2 emissions. Thus, the cement is a major contribution to achieving the goal of the Sustainable Concrete initiative to reduce the CO_2 footprint in concrete by 50% by 2030. According to Brian Dürr, who is sales director at Aalborg Portland, since the launch of FUTURECEM, there has been increasing interest and demand from both builders and contractors.

- Our customers work to get the cement implemented in their recipes and documented the properties to ensure the right quality, so they can offer these concretes when the contractors demand it. The message is that our RAPID cement can be replaced with FUTURECEM in the vast majority of concrete and achieve the same good concrete quality. Our customers are very positive about the cement's good properties on concrete pumpability and robustness. At the same time, we have seen really nice wall moldings, where the surface has been absolutely perfect. However, it is too early to conclude anything in general yet, not least because the amount of concrete produced remains limited.

LAUNCH OF UNI-GREEN

Of the companies that have embraced the groundbreaking cement, Aalborg Portland's subsidiary, Unicon, is the provisional banner bearer.

- Unicon has more than five years of experience with the new type of cement, says the company's technology manager, Ib Bælum Jensen.



UN17 project
construction site, Amager

Foto: Jakob Lerche.

- In the first phase, we were part of the Green Concrete consortium with design and development of the cement and finished with delivery for three full-scale demo projects, which included both Construction Concrete C35 / 45 and Passive Concrete C25 / 30. In the second phase before the actual market launch, we helped to fully test concrete internally at a concrete factory, including transport in a rotary truck and casting of paving stones and walls internally. On this basis, we have in the last phase of this year launched a completely new product series, UNI-Green, which is with FUTURECEM, and thus has a reduced CO_2eq environmental impact compared to the industry baseline of 25%.

PRELIMINARY EXPERIENCES

In total, Unicon has produced over 1000 m3, and currently the company has two projects that exclusively use the new type of concrete. The experiences are many, and most of them are good, Ib Bælum Jensen points out.

- When implementing a new sub-material, additive, aggregate, recycled aggregate or binder, it is often the case that you must have produced a certain amount of "real" concrete for a "real" customer before you can fine-tune the mix design, so the fresh and hardened concrete has the desired properties. This has also been the case in this connection.

We are still learning and developing, says the technology manager and lists the following preliminary experiences:

- Low-strength SCC concrete becomes a little more robust against separation and bleeding, presumably due to the fine lime and clay.
- Fewer pumping problems with low-strength concrete for the same reason as mentioned above.

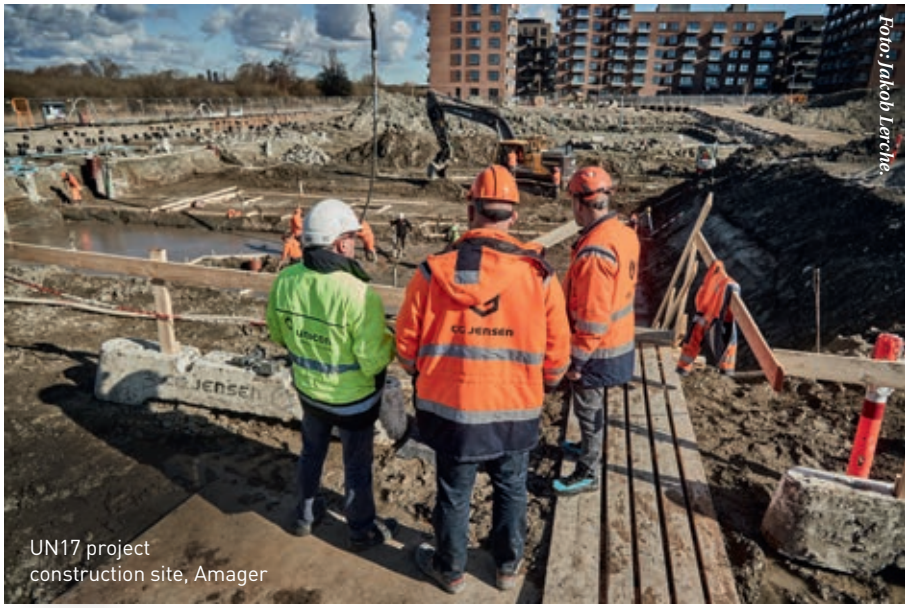


Foto: Jakob Lerche.

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- A completely different use of the current additives if you want unchanged fresh concrete properties.
- Should more silos be set up, or should phasing in take place at the expense of phasing out other binders?
- Slightly lower early compressive strengths, but roughly the same 28 day compressive strengths.
- No difference in setting course for comparable concrete types.
- Color difference compared to previous concrete, as the new one is slightly brownish, but has the advantage that you can see that the brown concrete is "green" concrete.
- The interest in reduced CO_2eq environmental impact is so far greatest among authorities and the developers than at the contractor level.
- Most of the experiences are from the cold season, so it will be exciting to see when the concrete gets hot in the late summer.

IT MUST BE SIMPLE TO BUILD SUSTAINABLY

Jan Søndergaard Hansen, managing director of Unicon, points out that Unicon's strategy is to mirror its standard gray ready-mixed concrete product program into a complete green product program, under the name UniGreen.

- In the long run, we expect the UniGreen product program to become our new standard program. The purpose is to make it possible to use CO_2-reduced ready-mixed concrete in all buildings across the country. It has been a cardinal point for Unicon that the offered CO_2-reduced concrete must have the same usability in terms of finish and efficiency and of course with the same long durability as our standard gray products.

- Already now, with the use of FUTURECEM, we can reduce by 25% CO_2 compared to the industry benchmark in 2019, and we have several initiatives on the way that will ensure that we reach the goal of halving in 2030.

When there is a little more demand for CO_2-reduced concrete, for example due to updates in the building regulations, we expect that the other ready-mixed concrete producers will develop a corresponding CO_2-reduced concrete program.

About FUTURECEM and development project CALLISTE

FUTURECEM, which is a composite cement, contains in addition to cement clinker also lime filler and burnt / calcined clay, and therefore it behaves differently than other types of cement. A new development project called CALLISTE, which includes Aalborg Portland, the Danish Technological Institute, Dansk Beton, Unicon and several other parties in the concrete industry, builds on FUTURECEM technology and aims to achieve an extremely high replacement of cement clinker with calcined clay and lime - up to 50%. Read more about CALLISTE at baeredygtigbeton.dk under research projects.

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