Troldtekt® based on FUTURECEM

Acoustic panels with a reduced carbon footprint

New cement type – even more advantages

Troldtekt acoustic panels based on FUTURECEM™ have a reduced carbon footprint which is 26 to 38 per cent lower – depending on product variant – than the footprints of Troldtekt acoustic panels based on traditional cement.

The cement in Troldtekt cement-bonded wood wool is responsible for the strength, durability and fireproofing properties of the acoustic panels. However, the cement also accounts for virtually their entire carbon footprint. Therefore, it is something of a breakthrough that it is now possible to choose Troldtekt based on FUTURECEM cement from Aalborg Portland.

Using FUTURECEM, it is possible to look after the climate while preserving all the well-known advantages of Troldtekt acoustic panels.

Cement with a reduced footprint
FUTURECEM exploits the synergies between calcined clay and limestone filler. In this way, much of the fired clinker in the cement can be replaced, resulting in cement that has an approx. 30 per cent reduced carbon footprint.

Over their entire product life cycle, the carbon footprint of Troldtekt acoustic panels based on FUTURECEM is:

- 26 per cent lower than that of Troldtekt based on grey cement
- 38 per cent lower than that of Troldtekt based on white cement

Recycling
In addition to reducing the carbon footprint of the acoustic panels during production, Troldtekt is working on various methods of recycling. This will ensure that as little of the embedded CO_2 as possible is released during incineration when the acoustic panels reach the end of their useful life (typically after 50-70 years) – and thus help to reduce their carbon footprint even further.

Six good reasons for choosing Troldtekt

1. Superior acoustics
2. Healthy indoor climate
3. Documented sustainability
4. Effective fire protection
5. Natural strength
6. Simple installation

The entire range of Troldtekt cement-bonded wood wool products in natural wood/natural grey and painted in standard colours is certified at Gold level in accordance with the sustainable Cradle to Cradle design concept.

New EPDs ensure complete transparency

Consultants and clients can now download environmental product declarations (EPDs) for different types of Troldtekt acoustic panels based on FUTURECEM. The life cycle analyses document the total carbon footprint.

The German Institut Bauen und Umwelt (IBU) has verified eight environmental product declarations (EPDs) for Troldtekt acoustic panels based on FUTURECEM, which have subsequently been issued by BRE.

The EPDs offer construction industry professionals an overview of the acoustic panels' environmental impact throughout their life cycle. This enables comparisons to be made with alternative solutions, paving the way for informed choices in connection with building projects.

A documented reduced carbon footprint
The environmental impact of raw materials, transport, production, use, disposal and the potential for recycling are reflected in the life cycle analysis on which the EPDs are based. The analysis documents that throughout their entire life cycle, Troldtekt acoustic panels based on FUTURECEM have a reduced carbon footprint which is 26 to 38 per cent lower – depending on product variant – than the footprints of Troldtekt acoustic panels based on traditional cement.

CO_2 is absorbed during use
Troldtekt acoustic panels are manufactured from Danish wood and cement. Cement production emits considerable amounts of CO_2 but the wood content in the production stage pulls in the opposite direction. This is because wood binds CO_2 when the tree is growing.

In addition, the cement means that an acoustic panel absorbs CO_2 during its use stage as a result of the chemical process of carbonatisation.

The CO_2 that is stored in the wood is released if the Troldtekt acoustic panels are incinerated at the end of their useful life (typically after 50-70 years). This impacts stage C4 in the EPDs, which covers disposal.

Circular economy holds huge potential
Different types of waste management can result in large differences in reported CO_2 emissions during stage C4 of an EPD. As Troldtekt's production is based in Denmark, which is also our main market, we have to state what kind of waste handling is used in Denmark – and cement-bonded wood wool are normally incinerated in Denmark. In other markets, different waste handling methods may be used, such as landfill, where the waste is buried in the ground. However, this is not a good solution from an environmental point of view. Depending on the standard or version of the standard used, CO_2emissions from the EPDs' stage 4 (end of life) can vary.

We expect that, within the next few years, it will be possible for end-of-life Troldtekt acoustic panels to add more value in the circular economy. We've planned a pilot project together with several Danish municipalities which involves collecting cement-bonded wood wool waste for use, for example, as a raw material in new cement at Aalborg Portland. If all goes according to plan, this is expected to result in a reduced carbon footprint.

For increased transparency, Troldtekt makes separate EPDs available for eight different product variants based on FUTURECEM:

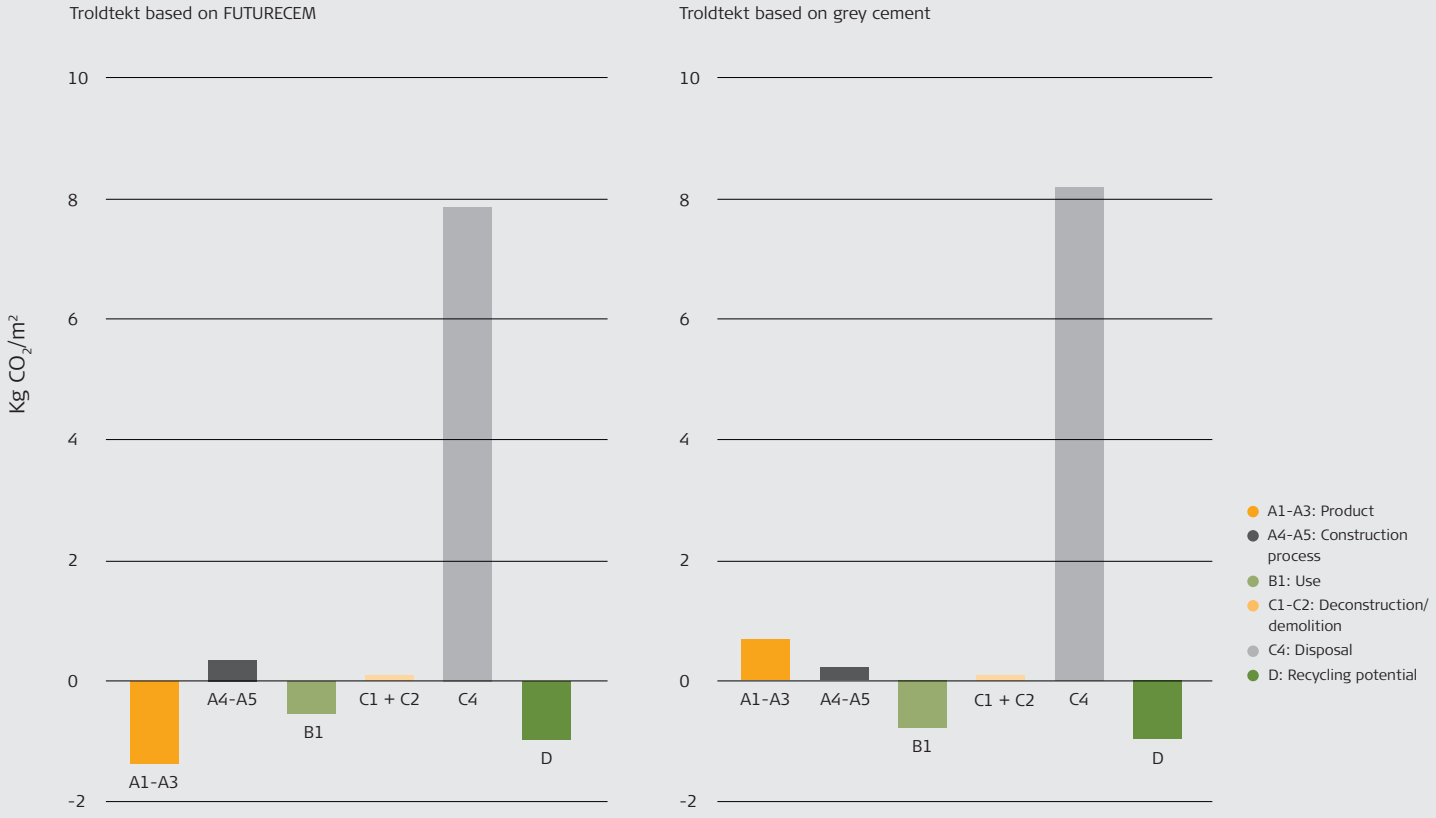
Acoustic panels based on FUTURECEM: 25 mm
- Troldtekt acoustic panels, natural grey - unpainted
- Troldtekt acoustic panels, natural grey - painted
- Troldtekt A2, natural grey - unpainted
- Troldtekt A2, natural grey - painted

Acoustic panels based on FUTURECEM: 35 mm
- Troldtekt acoustic panels, natural grey - unpainted
- Troldtekt acoustic panels, natural grey - painted
- Troldtekt A2, natural grey - unpainted
- Troldtekt A2, natural grey - painted

Complete overview of environmental footprint

Troldtekt's EPDs are prepared in accordance with EN 15804-A1 and comprise stages A1-A3, A4-A5, B1, C1-C2, C4 and D. When comparing several products, it is important to conduct the assessment based on the same product stages.

Description of the system boundary (x = included in LCA; MND = module not declared; MNR = module not relevant)															
Product stage			**Construction process stage**		**Use stage**							**End-of-life stage**				**Benefits and loads beyond the system boundaries**
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse/recovery/recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	x	MND	MNR	MNR	MNR	MND	MND	x	x	MND	x	x



The bar charts show the carbon footprints of Troldtekt acoustic panels based on traditional grey cement and panels based on FUTURECEM in the various life cycle stages.

FUTURECEM ensures a negative carbon footprint in stages A1-A3, as the wood absorbs more CO_2 while the trees are growing than is emitted during the production of the cement, during the transport of the raw materials and during the manufacture of the acoustic panels.

During use (stage B), the carbon footprint is negative for all Troldtekt acoustic panels, because the panels absorb CO_2 via the chemical process of carbonatisation.

During disposal (C4), embodied carbon is released during incineration, and the carbon footprint is therefore positive. As the incineration of Troldtekt cement-bonded wood wool also generates energy that can replace energy from fossil fuels, a negative carbon footprint has also been registered under recycling potential (D).

The total carbon footprint for Troldtekt acoustic panels based on traditional grey cement is 7.41 kg CO_2-Eq/m² throughout their entire product life cycle, while for Troldtekt acoustic panels based on FUTURECEM it is 5.45 kg CO2-Eq/m².

The path to a lower carbon footprint

At Troldtekt, we are continuously working to reduce the climate impact of our acoustic panels. With acoustic panels based on FUTURECEM, we have taken a big step in the right direction.

The ability to mix the wood in the acoustic panels with FUTURECEM rather than traditional cement represents a milestone in Troldtekt's strategic work on sustainability.

"It's the cement that gives Troldtekt acoustic panels their strength, durability and fire-protective properties without the use of harmful chemicals. At present, these properties are difficult to achieve using binders other than cement. FUTURECEM makes it possible to look after the climate while preserving all the well-known advantages of the acoustic panels," comments Vibeke Pedersen, Head of Engineering Department at Troldtekt A/S.

Renewable energy at factory
When calculating a company's CO_2 emissions, a distinction is made between:

Scope 1 – direct emissions from the company's own sources
Scope 2 – indirect emissions from the company's consumption of energy
Scope 3 – other indirect emissions, including emissions from the sourcing of goods from external suppliers.

For a number of years, Troldtekt has been working systematically to increase the proportion of renewable energy in our own production so that the energy used now comes almost exclusively from carbon-neutral energy sources. In recent years, we have achieved approx. 98 per cent.

"It has been harder to make reductions under Scope 3, where our purchases of cement account for virtually all emissions. However, together with our regular cement supplier, Aalborg Portland, we have taken a significant step in the right direction with the introduction of

At Troldtekt's high-tech factory in Denmark, approx. 98 per cent of energy consumption comes from carbon-neutral energy sources.

"FUTURECEM makes it possible to look after the climate while preserving all the well-known advantages of the acoustic panels."

Troldtekt acoustic panels based on FUTURECEM," said Vibeke Pedersen.

Ambitions for more improvements
However, the path towards a reduced carbon footprint does not stop here, adds Tina Snedker Kristensen, Head of Sustainability & Communications at Troldtekt:

"Reducing the carbon footprint of cement is not the only avenue we're exploring. Various development projects are also looking at whether alternative binders will be able to supplement or completely replace cement in the long term. For now, we're certainly pleased with Troldtekt acoustic panels based on FUTURECEM, as it means we can significantly reduce the CO_2 emissions per acoustic panel in one go."

Using FUTURECEM does not in any way compromise the strength, durability, fire-protective properties or acoustic properties of the acoustic panels, which remain at the same high level as in panels manufactured using traditional cement.

Old rectory fully modernised

At his home near Limfjorden in western Jutland, the Danish designer Søren Vester is testing his design ideas in connection with the ongoing renovation of the property. Here, he has installed a Troldtekt v-line acoustic ceiling with panels based on FUTURECEM.

Søren Vester is a designer, and runs his own practice Vesters Workshop, which assists homeowners wanting to design their dream property.

Søren Vester lives with his family in an old vicarage dating back to 1896 near Limfjorden in western Jutland, Denmark, where there are always new projects on the drawing board.

With a steady stream of visitors dropping by, the kitchen-dining room and Søren Vester's creative office are often full of people talking, laughing and discussing all sorts of ideas. However, combined with a fondness for hard materials such as concrete floors and natural walls, this is a recipe for poor acoustics. Therefore, Søren chose to install Troldtekt acoustic panels from the Troldtekt v-line design series.

"I love our concrete floor, where our dog can run around and we can walk in and out in our wellies. Through using the entire ceiling to regulate the acoustics, we can now sit down for lunch and easily hear what each other is saying. Also, hearing-aid users say there's a noticeable difference, as the sound doesn't reverberate nearly as much as it used to."

Honest material

Søren Vester chose Troldtekt acoustic panels based on FUTURECEM cement. Measured throughout their entire life cycle, the panels have a carbon footprint which is 26 per cent lower than that of Troldtekt acoustic panels based on traditional grey cement. Sustainability is a paramount design choice for Søren Vester:

"It's the only way forward. It's important to use materials that will last and which don't contain harmful chemicals. The material must be honest through and through, and with Troldtekt acoustic panels based on FUTURECEM, the carbon footprint is significantly reduced," he says.

Troldtekt v-line adds discreet v-shaped grooves running lengthwise across the ceiling. Søren Vester has chosen the ceiling in the natural colour of the cement type FUTURECEM, which, among other things, contains calcined clay.

"The greyish colour changes with the light and has a rougher look, but it adds edge to the old rectory and goes well with the ceiling beams. It's not the idea that everything should look too polished – the simpler, the better," concludes the designer.

Freedom to combine form and function

Troldtekt acoustic panels with a reduced carbon footprint are available in a range of structures, colours and designs. The choice is yours.

↑ A Troldtekt v-line design solution based on FUTURECEM – in a black-painted version.

Troldtekt acoustic panels based on FUTURECEM allow you to combine superior acoustics and a healthy indoor climate with a distinctive look.

FUTURECEM gives the Troldtekt acoustic panels a slightly warmer hue compared to panels made using traditional grey cement. You can choose panels in natural wood, where the colour from the FUTURECEM cement stands out or you can order the panels factory-painted in one of our standard or custom colours.

Distinctive design
You can also choose the distinctive series of Troldtekt design solutions in variants based on FUTURECEM.

The design series enables you to create your own patterns and rhythms – and vary and scale the individual solutions as you wish. The design solutions are mass-produced, drawing on CNC technology. This means that they are competitively priced. All the solutions are designed to ensure that ceilings or walls are experienced as large unbroken surfaces.

↑ FUTURECEM gives the Troldtekt acoustic panels a slightly warmer hue compared to panels manufactured using traditional cement.

↑ The meeting room features an elegant solution with framed Troldtekt curves acoustic panels based on FUTURECEM.

↑ A private home in which black-painted Troldtekt v-line acoustic panels based on FUTURECEM have been chosen.

The designer Søren Vester's private home, Denmark

Søren Vester tests out his design ideas in connection with the ongoing renovation of his own home. Most recently, he has installed a Troldtekt v-line acoustic ceiling with panels based on the new cement type FUTURECEM.

Project: Private house in Thise, Denmark

Architect: Søren Vester

Client: Søren Vester

Troldtekt solution: Troldtekt v-line based on FUTURECEM

Mandrup Arkitekt I Ingeniør, consultancy firm, Denmark

The entrance lobby at Mandrup, a firm of architects and engineers in Viborg, welcomes visitors with Troldtekt's new acoustic panels based on FUTURECEM in the decorative design curves.

Project: New premises for the firm Mandrup Arkitekt | Ingeniør in Viborg, Denmark

Architects: Mandrup Arkitekt | Ingeniør

Client: Mandrup Arkitekt | Ingeniør

Troldtekt solution: Troldtekt curves based on FUTURECEM and Troldtekt line design

Sand & Lundgaard Arkitektfirma, architect firm, Denmark

The architects Sand & Lundgaard, based in Grindsted in Jutland, have moved to more spacious premises where they have been able to have a say in the interior design and showcase their approach to modern architecture.

Project: Sand & Lundgaard Arkitektfirma

Architects: Sand & Lundgaard Arkitektfirma

Client: Sand & Lundgaard Arkitektfirma

Troldtekt solution: Troldtekt v-line based on FUTURECEM

Holiday home in Frederiksværk, Denmark

In a scenic area between Zealand's north coast and Denmark's largest lake, Arresø, Cirkulært Byggeri has built a holiday home that serves as a pilot project for future sustainable homes.

Project: Holiday home, pilot project in Frederiksværk, Denmark

Architect: André Bøgelund Jahn

Client: Cirkulært Byggeri ApS, owned by André Bøgelund Jahn

Troldtekt solution: Troldtekt v-line based on FUTURECEM, black-painted 207

CEBRA Architecture, architect firm, Denmark

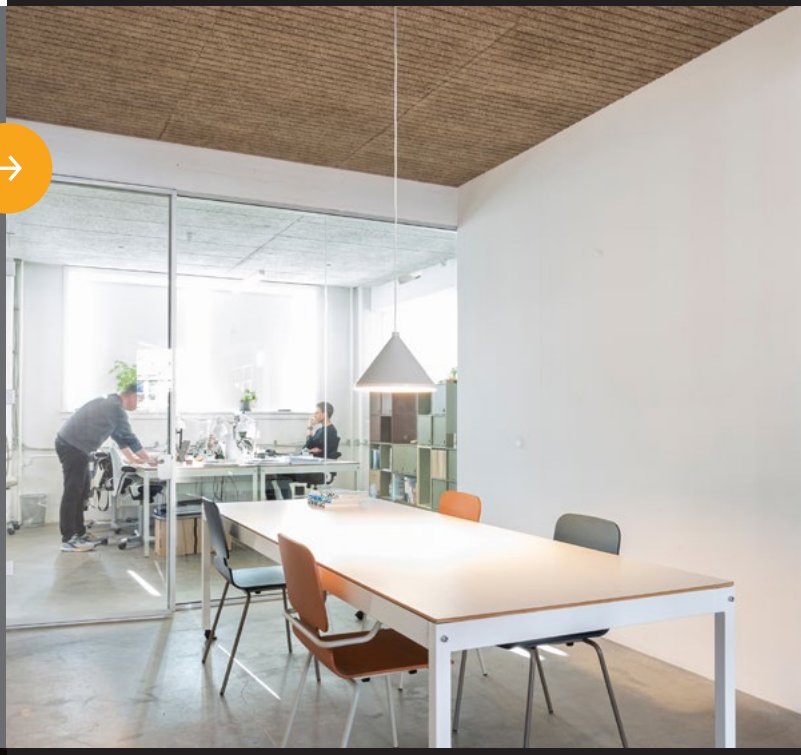
CEBRA has refurbished its own design studio in Aarhus, for which it chose the Troldtekt v-line design solution based on FUTURECEM.

Project: Refurbishment of drawing studio at CEBRA

Architects: CEBRA

Client: CEBRA

Troldtekt solution: Troldtekt v-line based on FUTURECEM



Fladbrohus, private home, Denmark

The villa in the forest was designed and built in the mid-1960s to accommodate the architect's own family and his design studio. The architectural gem has been completely refurbished to create a long-lasting house, where Troldtekt v-line based on FUTURECEM has been chosen for the ceilings.

Project: Refurbishment of Fladbrohus

Architect: BRUNOJAKOBSENDESIGN

Client: @fladbrohus

Troldtekt solution: Troldtekt v-line based on FUTURECEM, black-painted 207

Awards and distinctions

German Sustainability Award 2023

Cradle to Cradle-certified Troldtekt based on FUTURECEM won one of the prestigious German sustainability awards presented in December 2022. Troldtekt won in the Design category. The German Sustainability Award is generally recognised as one of Europe's most important award for sustainability and social commitment.

SIEGER
Deutscher Nachhaltigkeitspreis Design 2023

materialPREIS 2022

The award, which is organised by raumprobe, celebrates outstanding and innovative building materials of high quality. Troldtekt based on FUTURECEM was among the winners in 2022.

materialPREIS2022
Die Auszeichnung für besondere Materialien

Green Product Award 2022

Troldtekt based on FUTURECEM won a Green Product Award 2022. The international award honours innovative and sustainable design solutions. Troldtekt was named 'Best of' in the Building components category.

Green Product Award
Winner 2022

German Innovation Award 2022

The German Design Council is behind the award, which pays tribute to innovations which, among other things, lead to enhanced sustainability while minimising energy and resource consumption. Troldtekt acoustic panels based on FUTURECEM won the award in the 'Excellence in Business to Business' category.

GERMAN INNOVATION AWARD '22 WINNER

Danish Building Industry Climate Award

Troldtekt was honoured as 'Most Innovative Natural Acoustic Troldtekt acoustic panels based on FUTURECEM™ were among the nominees for the Danish Building Industry Climate Award 2022 presented by Danske Byggecentre (Danish Construction Centre). In 2022, the Award was presented to Aalborg Portland for their introduction of FUTURECEM™, a new product that helps give Troldtekt acoustic panels a reduced carbon footprint.

Nomineret til:
Byggeriets Klimapris

HEALTHY INDOOR CLIMATE SINCE 1935

Troldtekt A/S has been designing, developing and manufacturing Troldtekt acoustic panels since 1935 – from locally sourced natural materials and under state-of-the-art conditions with minimal environmental impact. Our products are developed and manufactured in Denmark and distributed in numerous countries around the world.

We are trendsetting
Our vision is to be a trendsetter within intelligent acoustic solutions that focus on a sustainable indoor climate. We therefore develop new solutions in close collaboration with industry experts, architects, and other building consultants.

We take responsibility
It is important for us to play a responsible role in society – also for our own sake. We believe companies do well by doing good. We have therefore systematised our social responsibility efforts by committing to the UN Global Compact – the world's largest voluntary corporate social responsibility initiative.

We create added value
The sustainable Cradle to Cradle design concept is a key part of our business strategy. The concept focuses on ensuring that materials add value for the environment, for society and for our business. Through our collaboration with the international research and advisory institute EPEA, we ensure that our activities are in line with the international Cradle to Cradle principles.

We are part of a group with ambitious climate goals
Since 2022, Troldtekt has been part of the Kingspan Group, a listed Irish building materials company with operations in more than 70 countries. With its Planet Passionate programme, Kingspan is setting ambitious climate goals that are very much in line with Troldtekt's Cradle to Cradle strategy. By 2030, Kingspan's ambitious targets include zero waste to landfill and carbon-neutral manufacturing.

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This printed matter is produced to the highest possible environmental standards.

The printed matter is Cradle to Cradle-certified, which is one of the world's strictest environmental certifications. The certification is your guarantee that the paper and inks are produced without chemicals or heavy metals.

The printed matter also carries the Nordic Swan Ecolabel – the official ecolabel throughout the Nordic region. The label makes it easy to choose the best products for the environment.

The printed matter is also produced to net zero carbon standards, as the printing company uses local wind power, documented via certificates of origin. The wood for the paper comes from sustainable FSC forestry operations, which means, among other things, that no more wood is felled than the forests can reproduce.

Visit Troldtekt online for more inspiration:

#troldtekt
#goodacoustics

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