

# Troldekt A/S Corporate Social Responsibility

Communication on Progress for the UN 2021



# About this report

At Troldekt A/S, social responsibility is a central part of our business strategy. The Cradle to Cradle design concept and the UN Global Compact are the foundation of our CSR activities.

This report relates to the calendar year 2021. In publishing this report, Troldekt A/S confirms its continued support for the UN Global Compact. At the same time, the report describes the progress we have made within CSR, while also providing a status on our objectives and initiatives. Our CSR reporting is based on the Global Reporting Initiative (GRI). We remain inspired by the earlier GRI G4 Guidelines, which have now been replaced by the GRI Standards. This report is based on the same methodology and structured in the same way as recent reports, making it easier to compare the data. The areas reported on have been identified following a thorough materiality analysis, which we have carried out in collaboration with the consultancy firm Carve Consulting.

## Report structure

The report is divided into three sections. First, we describe Troldekt's

CSR efforts in general, providing a status from the Executive Board, highlights from 2021 as well as information about our organisation and general approach to CSR. In the second section, we talk in depth about our strategic work with the Cradle to Cradle sustainable design concept – including our efforts within each of the five categories of criteria covered by the certification. The third section of the report contains the actual reporting of data for 2021 under four headings: environment, labour conditions, society and human rights.

## Our standards are based on the UN Global Compact

Troldekt's CSR activities are anchored in the management as a strategic focal point for our business strategy, which is based on the Cradle to Cradle principles. In our internal CSR policy, we have introduced requirements for our daily activities based on the ten principles of the UN Global Compact. Our CSR policy is available online at [troldekt.com](http://troldekt.com). Our cooperation with our suppliers is based on our Code of Conduct, which is also available at [troldekt.com](http://troldekt.com).

### Want to know more?

If you have any questions about the report, please contact Tina Snedker Kristensen, Head of Sustainability and Communications at Troldekt, by phone (+45 8747 8124) or email ([tkr@troldekt.dk](mailto:tkr@troldekt.dk)). All Troldekt's CSR reports can be found online at [www.troldekt.com](http://www.troldekt.com).





One of the sustainable plantations from which trees used to produce Troldekt are sourced.

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# New milestones after a decade of Cradle to Cradle

In 2021, we completed the implementation of a number of product initiatives that will significantly reduce the carbon footprint of our acoustic panels. At the same time, the corona pandemic continued to cast a long shadow across our daily lives.

It is now more than a decade since Troldekt acoustic panels first achieved Cradle to Cradle certification. Pretty soon after the first certification, it became clear to us that the sustainable design concept is much more than a product certification. In 2012, we therefore decided to base our strategy on the Cradle to Cradle principles, which focus, among other things, on the reutilisation of materials in new cycles and on using renewable energy in production. Our decision back then has in many ways revolutionised our business.

Cradle to Cradle has paved the way for investments in our factory that have led to 97.8 per cent of our energy consumption in 2021 coming from renewable sources. The principles have also guided us in the development of even healthier products. One example was the switch in 2021 to new paint recipes, which resulted in our advancement in early 2022 to Cradle to Cradle certification at Gold level.

## Revolutionary cement

Cradle to Cradle has also been the backdrop for what has perhaps been Troldekt's biggest leap to date towards greater sustainability: the development of acoustic panels with a negative carbon footprint in all phases of production. The new cement type FUTURECEM™ patented by our cement supplier Aalborg Portland has enabled us to launch panels that absorb more



CO<sub>2</sub> than they emit during production. The explanation is that the wood in the acoustic panel absorbs more CO<sub>2</sub> while the trees are growing than is emitted during the production of FUTURECEM. And since the production at our own factory is virtually carbon-neutral, total emissions during production are negative. This is a new product that we are exceedingly proud of, and which we spent a good chunk of 2021 developing.

## Corona hit hard

However, 2021 not only brought positive news. The corona pandemic continued to cast a long shadow across most of the world. At Troldekt, we felt this most acutely in late autumn as we lost a dear colleague to the disease. May she rest in peace.

The pandemic continued to affect our working lives, although to a less dramatic extent, as measures designed to prevent infection put our patience, logistics systems and social cohesion to the test. We hope that 2022 will be

the year in which corona finally loosens its grip on Denmark and the rest of the world.

## New strong forces on board

In 2021, Troldekt outgrew the Danish category of small and medium-sized enterprises (SMEs) as our revenue topped DKK 500 million. Being a large company comes with even greater responsibilities, and in 2022, new and strong forces

will be joining us as we continue our successful journey. In 2021, we spent some time exploring the market with a view to find a suitable new owner, and this resulted in an agreement being made with the Kingspan Group, an Irish construction group with a global presence. Troldekt will thus be joining a group that shares our strong ambitions within sustainability.

Our CSR strategy will still be inspired by the ten principles of the UN Global Compact which we wholeheartedly support. Once again, I would like to express my huge thanks to all Troldekt's employees whose concrete actions make a positive difference to the realisation of our strategy on a daily basis.

Peer Leth, CEO of Troldekt A/S

# More awards for CSR initiatives

In 2021, Trolldtekt was once again honoured for its strategic focus on documented sustainability and social responsibility.

## Architects' Darling

In November 2021, a jury of renowned German architects awarded Trolldtekt the Architects' Darling 2021 prize in the Cradle-to-Cradle Challenge category, which celebrates sustainable companies. The leading German architecture portal Heinze is behind the award which was presented to Trolldtekt at an awards show in Celle in Germany.

Trolldtekt was honoured for its strategic approach to sustainability through more than a decade of working with the Cradle to Cradle concept.



**Green Product Award**

Nominee  
2022



## Green Product Award

The new Trolldtekt® acoustic panels based on the greener cement type FUTURECEM™ were – even before the launch of the panels – nominated for the Green Product Award 2022. The global award honours innovative and sustainable solutions that shift the market in a green direction. The carbon footprint of FUTURECEM is approximately 30 per cent lower than the carbon footprint of traditional cement. The wood, which is the other raw material in Trolldtekt acoustic panels, absorbs CO<sub>2</sub> as the trees grow in the Danish forests. And since production at Trolldtekt's own factory is based on renewable energy, the new acoustic panels' total carbon footprint ends up being negative when measuring the raw materials used, transport of the raw materials and the manufacturing of the products. Trolldtekt was nominated for the Green Product Award in 2021, and in May 2022, it was announced that Trolldtekt based on FUTURECEM was among the winners.

## SMV COP

For the second year running, in September 2021, Trolldtekt was recognised as one of the best Danish SMEs (with up to 250 employees) at reporting on CSR. Every year, FSR – Danish Auditors and Global Compact Network Denmark compile the list in connection with the SMV COP event. One of the reasons why Trolldtekt has made it onto the 2021 list is that Trolldtekt's CSR report for 2020 was "a thorough and comprehensible report with clear messages that provide a good introduction to Trolldtekt's work with social responsibility".





Material  
health

## Optimised paint

In 2021, we started using new and more sustainable paint recipes in production. This has paved the way for Troldekt advancing to the highest level (Platinum) in the Cradle to Cradle material health category – and to Gold level in our overall certification.

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Renewable  
Energy

# -1.4 kg

In 2021, we developed acoustic panels based on the new cement type FUTURECEM™. Unpainted Troldekt cement-bonded wood wool based on FUTURECEM has a carbon footprint of -1.4 kg per square metre of acoustic panel during the production phases.

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Renewable  
Energy

# 97.8%

In 2021, 97.8 per cent of our energy consumption came from renewable sources. All electricity used in our production comes from wind power, and the heat used, among other things, in the drying process is generated by our own biomass plant.

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## New lake

In 2021, we established a rainwater lake on our factory site. The lake acts as an overflow basin and collects surface water from our new warehouse and logistics facility. Planting around the lake supports biodiversity.

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## Clear foil

In 2021, we developed a new type of packaging, which means that Trolldtekt acoustic panels are now delivered to customers on pallets wrapped in clear foil rather than white plastic. Clear plastic makes it easier to recycle the foil.

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## Local support

In 2021, Trolldtekt made a financial contribution towards Trolldhede's new activity area and the replacement of the speaker system in the sports hall. Both venues are important gathering places for the citizens of Trolldhede.

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# Innovative, trustworthy and socially responsible

The creation of sustainable indoor climate solutions is the guiding principle for Troldekt. This has paved the way for solid growth which continued in 2021.



Troldekt has produced cement-bonded wood wool acoustic panels since 1935, and today, Troldekt is one of Europe's leading suppliers of acoustic solutions. We use the same raw materials as we did 85 years ago: Norway spruce grown in Denmark and cement. However, through innovative optimisations we are continuously taking our products and recipes in an even more sustainable direction. Among other things, we now offer acoustic panels based on the cement type FUTURECEM which emits approximately 30 per cent less CO<sub>2</sub> than traditional cement.

All production takes place in Denmark at high-tech and environmentally friendly facilities. Investments in greener technology at our factory are in line with our business strategy which is based on the Cradle to Cradle design concept. Sustainability thus plays a crucial role in our work – because we believe that it will pay off in the long term.

## Activities

Troldekt's main activity is the development, manufacture and sale of

## Vision, mission and guiding principle

- Troldekt's vision is to be a trendsetting supplier of intelligent acoustic solutions.
- Our mission is to be a creator and communicator of innovative acoustic solutions.
- Our guiding principle is sustainable indoor climates.

## Values



We are innovative

We create results through development. Innovation must ensure that Troldekt is a trendsetter within intelligent acoustic and sustainable indoor climate solutions.



We are credible

We do what we say, and we keep our promises. We also communicate openly about our sustainable objectives and results.



We are socially responsible

We act responsibly in all parts of our business, including in relation to the environment, society and employees. Corporate responsibility is rooted in our strategic work with Cradle to Cradle.





acoustic wall and ceiling panels based on cement-bonded wood wool. The acoustic panels are used in all types of buildings: private homes, schools and institutions, restaurants, offices and corporate headquarters, industry, sports halls and swimming pools.

Our solutions integrate superior acoustics, effective fire protection and a healthy indoor climate with ventilation and flexible design options. Production takes place at state-of-the-art factory facilities in the village of Troldhede in western Jutland where we are about to expand capacity with a brand-new factory next to the current one.

Sales, administration, marketing and technical support functions are located at the company's head office in Tranbjerg, a suburb of Aarhus. Troldekt's German subsidiary, Troldekt GmbH, has had an office in Hamburg since 2015, and in Sweden

Troldekt AB has an office in Malmö. Troldekt works with distributors on the other export markets.

#### Organisational changes

Troldekt continued its growth journey in 2021 and is no longer categorised as an SME in that revenue now exceeds the DKK 500 million threshold applied in many contexts.

Employee numbers were again up following recruitment for specialist functions at our Danish head office as well as the further strengthening of the sales organisation in our German subsidiary. We also hired several hourly paid colleagues as a result of our continued investments in increased production capacity.

At the request of our shareholders, in 2021, we initiated the process of finding a suitable new owner to help unleash Troldekt's ambitions for international growth. In early 2022,

an agreement was reached with Irish Kingspan Group, which is the new owner of Troldekt. Troldekt is joining a global group that shares our vision of sustainability in construction as evidenced by its ambitious sustainability programme Planet Passionate.

#### Role and markets

Troldekt's direct customers are timber merchants and DIY stores/builders' merchants, while the company's indirect customers comprise building consultants, architects and private clients.

Our three domestic markets in Denmark, Germany and Sweden play by far the most important role in our business. In addition to these markets, Troldekt is primarily present in our neighbouring European markets.

#### Suppliers

Troldekt's Code of Conduct forms the basis for the company's cooperation with its suppliers. The Code of Conduct is based on the general principles of international conventions. All Troldekt's key suppliers are Danish and supply either certified wood, cement, paint, packaging or wind power.

#### Community activities

CSR is rooted in Troldekt's corporate culture, and it was therefore natural for the company to join the UN Global Compact and to subsequently integrate the Cradle to Cradle concept into our business strategy.

Troldekt plays an active role on a number of committees, in organisations and associations, including:

- Green Building Council Denmark
- Danish Construction Federation
- Danish Institute of Fire and Security Technology (DBI)
- Committee work in Danish Standards
- German Sustainable Building Council (DGNB)

#### Information

For more information on Troldekt A/S and the company's products, CSR activities and technical documentation, please visit [www.troldekt.com](http://www.troldekt.com).

# History of Trolldtekt 1855-2021

## 1855-1930

1855

**J. C. Seidelin**, a grocer, opens the first dedicated store for building materials at Fredens Torv in Aarhus.



1884

**Louis Hammerich** takes over the business and expands the range to include wholesale products and begins to import building materials.



1911

L. Hammerich Specialforretning i Bygningsartikler becomes **Aktieselskabet L. Hammerich & Co.** The public limited company has registration number 645, and is now one of the oldest surviving public companies in Denmark.



## 1931-1946

1931

The business has grown, and A/S L. Hammerich & Co. moves into modern new premises in Grønnegade in central Aarhus. **Poul Hammerich**, Louis's son, takes over the management of the company.



1935

A/S L. Hammerich & Co. acquires A/S Trolldhede Pladeindustri in Trolldhede. Fibreboard and cement-bonded wood wool **Trolldtekt**® panels are manufactured here, and a registered trademark is acquired in 1936.



1936

Poul Hammerich decides to establish the '**Grosserer L. Hammerich og Hustru Ellen, f. Lisbergs Legat**' foundation to support families and staff facing financial hardship. Poul Hammerich dies young, but the foundation is subsequently set up.



## 1947-1993

1947

**Svend Hammerich** joins the company management and helps to rebuild the company's position following the Second World War.



1977

The fourth generation of the Hammerich family, **Peter Hammerich**, joins the company management.

1982

The product range is extensively restructured, with **full focus on Trolldtekt** and a few goods for resale. All warehouse facilities are moved to Trolldhede, while sales and administration are moved to new offices on Klamsagervej in Åbyhøj, a suburb of Aarhus. Peter Hammerich leaves the company.

1988

**Thorkild Bjerglund Andersen**, who has been a member of the company's Board of Directors since 1973, purchases A/S L. Hammerich & Co.



1993

A/S L. Hammerich & Co. moves to the former premises of the sawmill Aarhus Savværk at Søren Nymarks Vej in Højbjerg, south of Aarhus.

## 1994-2008

### 1998

Outgrowing its premises again, A/S L. Hammerich & Co. moves to the old Østergaard manor in Malling, which Thorkild Bjerglund Andersen has renovated while farming the adjoining land. Huge investments are made in streamlining and modernising production in Trolldhede.



### 2000

The new millennium marks the beginning of a period of strong product development. Trolldtekt is no longer just acoustic panels, but acoustic solutions with integrated lighting, sound, ventilation and decorative elements.



### 2005

Thorkild Bjerglund Andersen's heirs take over the company and carry on the family-owned enterprise under the management of a professional advisory board.

### 2008

Following the business succession, A/S L. Hammerich & Co. moves to modern premises on Sletvej in Tranbjerg outside Aarhus, and the company name is abbreviated to L. Hammerich A/S.



## 2009-2015

### 2010

The 75<sup>th</sup> anniversary of the production of Trolldtekt acoustic panels is marked by changing the company name to Trolldtekt A/S. The very same year, Trolldtekt receives the Danish Building Industry Environment Award for its focus on the environment and sustainability throughout the product's entire life cycle.



### 2012

Trolldtekt qualifies for **Cradle to Cradle certification** at Silver level and prepares a roadmap for developing Cradle to Cradle quality at Trolldtekt through to 2022.



### 2014

The CSR Foundation awards Trolldtekt A/S the **CSR Awards' Strategy Prize** for its solid and strategic approach to CSR and for having rooted CSR in all parts of the business, including at executive level and in the business strategy.

### 2015

**Trolldtekt Deutschland GmbH** is established in Hamburg, the company's first foreign subsidiary. The strategic focus on neighbouring export markets is followed up by a significant expansion of production capacity in Trolldhede.

## 2016-2021

### 2016

The company's second foreign subsidiary, **Trolldtekt AB**, is established in Malmö in Sweden, and production capacity is further expanded.

### 2019

Extra capacity is needed to ensure Danish and international growth. At the beginning of 2019, Trolldtekt A/S therefore doubles production capacity with the inauguration of approximately 12,000 square meters of additional production facilities in Trolldhede.



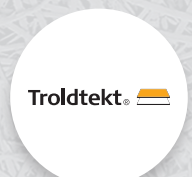
### 2020

Trolldtekt wins the **DI Award** for green transformation.



### 2021

Trolldtekt initiates the process of finding the right new owner of the company. In early 2022, it is announced that Trolldtekt is becoming part of the Irish group Kingspan Group.



# UN Global Compact: CSR based on UN principles

Corporate social responsibility is a fundamental value for Troldekt, and we have signed up to the UN Global Compact. Thus, we adhere to the UN Global Compact's ten principles – based on defined objectives in the areas of environment, labour conditions, society and human rights.

## Environment

At Troldekt, we are committed to ensuring that our activities contribute positively to the environment. Our environmental focus is manifested through concrete initiatives within material health, reutilisation, energy and water. The four categories are all part of the sustainable Cradle to Cradle concept on which our business strategy is based.

Troldekt acoustic panels are made from wood from Danish forests and cement extracted from Danish mineral resources. We offer acoustic panels based on the cement type FUTURECEM™ which has approximately 30 per cent lower

carbon footprint than traditional cement.

## Society

At Troldekt, we play an active role in society and engage in dialogue with the outside world – both the immediate neighbours of our factory in Troldehede and our suppliers. Our suppliers undertake to comply with our Code of Conduct, which makes it clear, among other things, that corruption and bribery are completely unacceptable.

We also support several associations and organisations, among others the Danish Association of the Hard of Hearing, the Danish Asthma and

Allergy Association, the Danish Acoustical Society (DAS) and the German Cradle to Cradle NGO.

## Labour conditions

Respect, co-determination, support and diversity in the workplace are key aspects of our daily working lives. We make a priority of retaining employees who are on sick leave, and of preventing industrial accidents and injuries. Furthermore, we support inclusion in the labour market, among other things via work experience schemes and by taking on flexijobbers.

In 1936, the then managing director and owner, Louis Hammerich, established a staff fund which provides financial support for former and present employees who are facing difficulties. The fund is still active.

## Human rights

At Troldekt, we support and work actively to promote human rights. We maintain a keen focus on human rights in our dealings with our suppliers and partners – via our Code of Conduct. This applies not only to our suppliers for production, but also to suppliers of services such as cleaning and waste handling.



## Want to know more?

Read Troldekt's CSR policy at [troldekt.com](https://troldekt.com) under the menu item 'Environment & CSR'. On our website, you will also find our CSR reports from previous years.



# SUSTAINABLE DEVELOPMENT GOALS

## Goals for a balanced world

In 2015, UN member countries adopted 17 common goals to ensure the balancing of the environmental and economic dimensions of sustainable development. Troldekt supports all 17 goals, but we have decided to focus on the four goals where we can make the biggest difference.



# A documented healthy material



Troldtekt acoustic panels contribute to a healthy indoor climate – both by ensuring good acoustics and because they are made from healthy materials. The panels have been thoroughly analysed in connection with our Cradle to Cradle certification. This means that all the ingredients have been analysed down to 100 parts per million – and that we have evidence that our acoustic panels do not contain any harmful substances.

## High standards involve positive as well as negative choices

Our high material health standards also mean that we sometimes decide to step back from particular courses of action in our product development. Due to uncertainty about the health implications for humans and the environment, we have for example decided not to treat our acoustic panels with the substance titanium dioxide which may be able to remove NOx particles from the air.

## Documented contributions

Under the Danish Indoor Climate Labelling scheme, Troldtekt's products are classified in the best categories for degassing and particle release. And finally, Ramboll has documented how Troldtekt contributes points under the leading, voluntary sustainable building certification schemes. In this context, a healthy indoor climate also plays an important role.



**SDG 3:** Good health and well-being

**Overall goal:** Ensure healthy lives and promote well-being for all at all ages.

**Target 3.9:** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

# Products for the circular economy

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



At Troldektek, we are committed to green production methods, and to design products with long useful lives that can live on in the circular economy after the end of their lives.

All the electricity we use in production comes from wind power, and the heat for our drying processes is, for example, generated by our own biomass-fired plant. And when it comes to the operation of our forklift trucks, we have almost completely replaced fossil fuels with green energy.

## Waste creates value

We sort our production waste into fractions to make the most of the resources at the highest possible value level in both the biological and technical cycles. In the biological cycle, we are working with a number of different solutions that will add another role – or cycle – for our cement-bonded wood wool waste before it ends its days as soil conditioner. At Aalborg Portland, dust from our edging workshop is returned to the technical cycle in the production of cement. A pilot project with the Municipality of Ringkøbing-Skjern – and in the next phase with seven other Danish municipalities – will enable us to scale up the scheme and ensure that end-of-life Troldektek acoustic panels from buildings can also be used in cement production.



**SDG 12:** Responsible consumption and production

**Overall goal:** Ensure sustainable consumption and production patterns.

**Target 12.6:** Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

**Target 12.7:** Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

**Target 12.c:** Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption (text is abbreviated).



# Certified to responsible forestry standards



Norway spruce sourced from Danish forests is one of the two primary raw materials used to produce Troldekt acoustic panels, and we buy a lot of raw wood every year. Wood is basically a healthy and sustainable material because trees absorb CO<sub>2</sub> while they grow. However, sustainability may suffer if animals, plants and people

working or living in the forests are not taken into account.

This is where the leading certifications for responsible forestry come into the picture. The international FSC and PEFC certification schemes both set certain standards when it comes to biodiversity, working conditions and the conservation of

forest areas. We have decided to use only certified wood, and therefore, we are certified under both schemes which means that all Troldekt acoustic panels are certified according to FSC (FSC®C115450) or PEFC (PEFC/09-31-030). And so the wood in each panel can be traced back to the forest where it came from.



## SDG 15: Life on land

**Overall goal:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

**Target 15.b:** Mobilise significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.

# Circular economy alliances

17 PARTNERSHIPS FOR THE GOALS



Troldekt works with a number of partners who – like us – are keen to promote circularity in construction.

In Denmark, for example, we have joined forces with FSC Denmark, and together we are striking a blow for more certified forests in Denmark in the public debate. We are also working with Aalborg Portland to derive the greatest possible value from our production waste.

## Supporting the circular economy

In Germany, we support, among others, Cradle to Cradle NGO, which works to promote the circular economy throughout society while in Sweden, we are a member of Cradlenet, which works for the same purpose. Similarly, we work with several other partners who share our approach to sustainable construction – and who are translating principles into action.



17 PARTNERSHIPS FOR THE GOALS



**SDG 17:** Partnerships for the goals






**Overall goal:** Strengthen the means of implementation and revitalize the global partnership for sustainable development.

**Target 17.16:** Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources (text is abbreviated).

**Target 17.17:** Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.



# Cradle to Cradle roadmap

	Results 2012-2020	Results 2021	Objectives 2022
<b>Material health</b> 	<ul style="list-style-type: none"> <li>✓ Troldekt acoustic series in natural wood/natural grey and standard colours C2C-certified.</li> <li>✓ Product development based on C2C principles.</li> <li>✓ Goods for resale produced as private label for Troldekt screened.</li> <li>✓ The wooden strips for Troldekt® contrast have, as the first goods for resale to be produced as private label for Troldekt, been given a Material Health Certificate.</li> </ul> <p><b>C2C SILVER status.</b></p>	<ul style="list-style-type: none"> <li>• Paint recipe optimised for the Troldekt acoustic series in natural wood/natural grey and standard colours can advance to <b>C2C level PLATINUM</b> in material health (Platinum achieved in March 2022).</li> </ul>	<ul style="list-style-type: none"> <li>• Goods for resale produced as private label for Troldekt must have a Material Health Certificate.</li> </ul>
<b>Material reutilisation</b> 	<ul style="list-style-type: none"> <li>✓ Production waste sorted into a number of fractions to ensure that resources from production waste are recovered at the highest possible value level.</li> <li>✓ Take-back scheme for collecting cement-bonded wood wool construction and demolition waste tested in the construction industry in Denmark.</li> <li>✓ Scheme using dust from production as a raw material in new cement from Aalborg Portland is established.</li> </ul> <p><b>C2C GOLD status.</b></p>	<ul style="list-style-type: none"> <li>• Agreement on crushing of panels concluded with external partner with a view to increased recycling in the biological and technical cycles.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and establish new solutions for recycling cement-bonded wood wool in the biological cycle.</li> <li>• Develop new products containing production waste (for example offcuts). In the longer term, develop products based on end-of-life acoustic panels from building industry.</li> <li>• Pilot project with seven municipalities is being carried out to pave the way for take-backs from recycling centres for use in technical cycle.</li> </ul>
<b>Renewable energy</b> 	<ul style="list-style-type: none"> <li>✓ Ørsted climate partner. 100% renewable energy for electricity consumption (wind power) from 2013.</li> <li>✓ New energy-efficient biomass plant run in.</li> <li>✓ 84% of diesel and gas-powered forklift trucks replaced with electric trucks.</li> <li>✓ Light sources in most of the production facilities replaced with LED.</li> </ul> <p><b>C2C GOLD level.</b></p>	<ul style="list-style-type: none"> <li>• 97.8% of energy consumed in production comes from renewable sources (wind power and biomass plant).</li> <li>• Acoustic panels based on the cement type FUTURECEM launched. FUTURECEM has a lower carbon footprint, and the panels are carbon-negative during production.</li> </ul>	<ul style="list-style-type: none"> <li>• Map possible alternative energy solutions from solar, wind or similar sources.</li> <li>• Explore the possibility of using waste heat from drying process.</li> </ul>
<b>Water stewardship</b> 	<ul style="list-style-type: none"> <li>✓ No untreated wastewater discharge from production.</li> <li>✓ Water-saving schemes established.</li> <li>✓ Separate sewerage system for all factory buildings established. Rainwater is discharged to municipal reservoir.</li> </ul> <p><b>C2C PLATINUM level.</b></p>	<ul style="list-style-type: none"> <li>• Overflow basin with planting established at new warehouse and logistics facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Explore the possibility of utilising water vapour from drying process.</li> <li>• Map the possibility of establishing an overflow reservoir with planting near new buildings.</li> </ul>
<b>Social fairness</b> 	<ul style="list-style-type: none"> <li>✓ CSR reporting to the UN Global Compact from 2010.</li> <li>✓ CSR reporting follows the GRI G4 structure.</li> <li>✓ C2C principles introduced in the organisation and value chain.</li> <li>✓ Action plan on noise reduction from the original factory line implemented.</li> </ul> <p><b>C2C GOLD status.</b></p>	<ul style="list-style-type: none"> <li>• Financial support given to local projects in Troldekte.</li> </ul>	

## New objectives in dialogue with new owner

When we decided to base our business strategy on the Cradle to Cradle principles in 2012, we published a strategic roadmap for improvements towards 2022. Since then, we have attained a number of milestones within the five categories of criteria towards the certification.

The time has now come to define new long-term goals, and we have decided to wait for the agreement with our new owner to fall into place.

We want to define the new targets in close cooperation with our new owner, the Irish group Kingspan Group which Troldekte joined in 2022. At the same time, we want to focus on Troldekte's next re-certification with Cradle to Cradle version 4.0.

### A group with ambitious goals

From working with the group's Planet Passionate sustainability programme, Kingspan has solid experience with the

principles of circularity. Troldekte's new long-term goals will therefore support both the Cradle to Cradle principles and the Planet Passionate programme which are to some extent overlapping.

Planet Passionate focuses on four areas: energy, carbon, circularity and water. Kingspan's ambitious goals include eliminating waste to landfill by 2030 as well as achieving carbon-neutral operations (net-zero emissions) by 2030.

# Cradle to Cradle: Troldekt advances from Silver to Gold

Corporate social responsibility is a fundamental value for Troldekt, and we have signed up to the UN Global Compact. Thus, we adhere to the UN Global Compact's ten principles – based on defined objectives in the areas of environment, labour conditions, society and human rights.

Since 2012, Troldekt's business strategy has been based on the sustainable and internationally recognised Cradle to Cradle concept. The vision behind Cradle to Cradle is a world in which manufacturers design their products for the circular economy – in other words where the materials can be reintroduced in new cycles.

In practice, our systematic work with Cradle to Cradle means that we hold detailed information about all the substances contained in Troldekt acoustic panels, right down to 100 parts per million. Analyses have shown that our panels do not contain any substances that are harmful to humans or the environment. Troldekt acoustic panels can therefore safely be returned to the biological cycle as a soil conditioner and form part of

the technical cycle as a resource in new cement.

### Certification at Gold level following switch to new paint

Ten years after the implementation of Cradle to Cradle in our business strategy, the range of Troldekt acoustic solutions based on cement-bonded wood wool advanced to certification at Gold level from March 2022 onwards. This is primarily the result of the introduction of new paint recipes in Troldekt's production in 2021.

Up until then, the preservatives in the paint for the acoustic panels had stood in the way of achieving certification at Gold level. However, we have now succeeded in designing recipes based on new and more sustainable conservation technologies.



The entire range of Troldekt cement-bonded wood wool products – both natural wood/natural grey and painted in standard colours – is certified.

Theme \ Tier	Basic	Bronze	Silver	Gold	Platinum
 Material health					✓
 Material reutilization				✓	
 Renewable energy				✓	
 Water stewardship					✓
 Social fairness				✓	

Cradle to Cradle Certified®:

# A framework for safe, circular and responsibly manufactured products

The Cradle to Cradle approach is essentially a tool for designing and manufacturing more sustainable products. However, multiple benefits are unleashed when companies base their entire business strategy on the concept. That is according to Dr Christina Raab, President & CEO of the Cradle to Cradle Products Innovation Institute

In 2022, it will be 20 years since the publication of the seminal book 'Cradle to Cradle: Remaking the way we make things'. Behind the book were German chemist Michael Braungart and American architect William McDonough, and both writers argued for a break with the single-use, throw-away approach to product development – but also with the idea that 'less harmful' products are good enough.

"It really was a seminal book because it argued holistically for a circular economy. At the same time, it became clear that if industry and commerce were to rethink the way they designed products, they would need a concrete and actionable tool," says Christina Raab, President & CEO of the Cradle to Cradle Products Innovation Institute.

The institute was established in 2010 to translate the book's ideas into action and help companies develop in the direction of a circular economy.

"The first companies to embrace the design concept came from the



*Christina Raab, President & CEO of the Cradle to Cradle Products Innovation Institute.*

construction industry and the personal care products sector. One of the authors has strong links with the world of architecture, which probably goes some way towards explaining why the construction industry

embraced the concept so eagerly," says Christina Raab.

### **Increasing demand**

Since then, many new sectors have come on board, and today more than 700 companies are working with the Cradle to Cradle Certified Products programme. About half are connected to the construction industry.

"Progressive developers and builders are increasingly stipulating requirements for Cradle to Cradle certification in their tender documents, but it's also increasingly common for the demand to come from the world of finance and investors who want to invest according to ESG criteria," Christina Raab says.

## FACTS: About the Cradle to Cradle Products Innovation Institute

- Founded as a non-profit organisation in 2010.
- The institute currently consists of a key team of 20 employees and has offices in both the USA (San Francisco) and Europe (Amsterdam).
- More than 700 companies worldwide are working with the Cradle to Cradle Certified framework tool so far.
- The companies are distributed across Europe, North America and Australia.

In the longer term, she hopes all new buildings and public tenders will require Cradle to Cradle-certified solutions.

The major building certifications such as DGNB, LEED, WELL and BREEAM have also helped boost demand for Cradle to Cradle certifications in recent years. The schemes recognise Cradle to Cradle-certified materials and products and award points for the certification.

### Benefits for companies

According to Christina Raab, only a small number of companies like Troldekt have to date based their entire business strategy on Cradle to Cradle principles, but she hopes many more will follow suit:

"Working with Cradle to Cradle Certified as a framework tool increases a company's credibility substantially. The requirements are very strict and comprehensive, and it's a third party-verified certification which investors, among others, are increasingly asking for," Christina Raab explains.

## FACTS: About Cradle to Cradle

- This design concept was inspired by the cycles of nature.
- Ideally, the products can be disassembled after use, and the materials can either be broken down into biological nutrients (biological cycle) or recycled into new products (technical cycle).
- The Cradle to Cradle Certified standard is continuously being updated, and requirements are becoming increasingly strict. The latest version (4.0) was published in March 2021.

"At the same time, it gives a company like Troldekt the opportunity to show leadership and brand itself as a leader of the sustainability agenda. The Cradle to Cradle Certified requirements are generally seen as the most stringent requirements out there," she adds.

Finally, she points out that companies that work with Cradle to Cradle Certified get a very practical framework tool for developing their business:

"It can really spark a company's development because it's such a concrete tool for translating commitments

into real and measurable action. At the same time, Cradle to Cradle Certified means the company is continuously improving and evolving, and so companies like Troldekt are able to stay ahead of the competition," she says.

### Five critical challenges

The Cradle to Cradle Certified Products standard focuses on five critical areas that must be considered when companies develop new products. In the new version 4.0 of the certification, the headings are:

- Material health
- Product circularity
- Clean air & climate protection
- Water & soil stewardship
- Social fairness

## New initiatives accentuate strategic focus

For more than a decade, the Cradle to Cradle principles have been strongly anchored in Troldekt's business strategy – and thus also in our senior management. In 2021, we further accentuated the strategic focus of our approach to sustainability.

The members of the Troldekt Management Group – the senior management team – came together for an innovation workshop in 2021. A key topic on the agenda was a thorough analysis of our sustainability profile prior to Troldekt being certified in 2023 according to the new version 4.0 of the Cradle to Cradle concept.

German EPEA Drees & Sommer, which works with Cradle to Cradle research and consultancy, facilitated the workshop.

### More resources for sustainability

Organisationally, in 2021 we also decided to devote more resources to sustainability through the appointment of a dedicated head of sustainability. Tina Snedker Kristensen, who is a member of the Management Group, is our new Head of Sustainability and Communications. In addition, our Marketing & Communications department has taken on a team leader, which will allow Tina Snedker Kristensen to devote more time to networking, presentations and other strategic sustainability initiatives.

At the end of 2021, our technical department started looking for an engineer to be dedicated to sustainability projects. The position was filled in March 2022.

According to Christina Raab, the construction industry has traditionally given priority to some categories over others, but in the future she expects to see a more holistic approach to sustainability – embracing circularity, climate action and social sustainability.

"Especially when it comes to the construction industry, product circularity is important. The Earth's resources are finite, and Cradle to Cradle certification requires an assessment to be made of whether a product is designed with circularity in mind – whether it can be disassembled and whether the materials can become part of new cycles. But we also look at the raw materials used and production," Christina Raab explains.

She also points out that the certification takes into account which systems are in place to further exploit the materials when their useful life is over.

# Investors are looking for companies with an ESG focus

In 2021, Troldekt started the process of finding a suitable new owner. The potential buyers were, among other things, interested in Troldekt's ambitious approach to sustainability. This is something that investors are increasingly looking for, explains Lars Rau Jacobsen, a partner and adviser on M&A transactions with Clearwater International.

Having spent some time trying to find a suitable new owner in 2021, Troldekt has become part of the Irish Kingspan Group from 2022.

Troldekt's strategic approach to sustainability is one of the main reasons why a construction group with a strong global presence would want to welcome a Danish acoustics company into the fold. Troldekt's approach is a perfect fit for Kingspan's Planet Passionate sustainability programme which focuses on energy, carbon, circularity and water. Kingspan's ambitions are perfectly aligned with Troldekt's business strategy which is based on the Cradle to Cradle design concept.

"In general, we're seeing that ESG is becoming more and more top-of-mind among prospective buyers of companies," says Lars Rau Jacobsen, a partner with Clearwater International, who has advised the owners and management during the process of finding the right new owner for Troldekt.

ESG stands for Environmental, Social and Governance, but the abbreviation is also used as a synonym for a company's CSR efforts and policies. In the field of M&A, ESG has become a very important parameter among buyers and investors in their evaluation of possible investments.

### Three trends are driving ESG appetite

According to Lars Rau Jacobsen, there are roughly three trends driving the demand for ESG investments.

"The first trend has been around for at least two decades and involves



*Lars Rau Jacobsen, a partner with Clearwater International.*

investors screening for activities they don't want to be associated with, or which may entail considerable risks for the target company. Both for moral reasons and because such activities entail a commercial risk. This goes, for example, for child labour, corruption or environmental conditions," he explains and continues:

"The next level is the investment perspective which has investors

looking at ESG investments based on the company's market and business model. Here, changing consumer trends and legislation are boosting demand for products and companies with a positive ESG profile. This level of ESG-driven investment has been surging within the past few years, due also to there being plenty of good opportunities for investing in companies with high growth and returns. So, ESG investing isn't necessarily driven





exclusively by philanthropy, but also by the possibility of creating a good financial return."

At the third level, there is yet another trend driving the demand for ESG investments:

"Investors traditionally require their investments to produce a certain return, but we're seeing a tendency for people to be willing to accept lower returns if it means they can make a difference through their investments from an ESG perspective. My own children's savings accounts are an excellent example. When setting up the accounts, I was asked by my bank advisor if I wanted to invest the money with a traditional investment fund or an investment fund with a focus on sustainability. And I'm very well aware

of what my children would say if they found out that their savings had been boosted by tobacco investments or the like. So I decided to accept a lower return, hoping that the investments would instead contribute to making the world a better place. And who knows, perhaps in the long run the investment might even turn out to make more financial sense as well," says Lars Rau Jacobsen.

#### **Sustainability must be profitable**

Lars Rau Jacobsen stresses, however, that if a company wants to look as attractive as possible to investors, working with ESG is not enough:

"Sustainability and ESG is great, but financially viable sustainability and ESG is even greater. Troldekt is a

good example, because their business is based on a strong product life cycle mindset. And they've recently launched a carbon-negative product with great potential in the construction industry. They're addressing the need for more sustainable building, but the product also makes sense from a commercial perspective," he says.

Lars Rau Jacobsen points out that while the demand for ESG investments has increased in recent years, the requirements for documentation and transparency have increased accordingly. In other words, companies must be able to document their green credentials:

"There's a lot of talk about green-washing in our industry, and it's important that companies looking for a new owner or investor can present facts and concrete measures to substantiate their green profile instead of trying to shine in borrowed feathers," he says.

Working with independent certifications and reporting on your progress regularly and systematically – like Troldekt – will lend credibility to your efforts, according to Lars Rau Jacobsen.

### FACTS: About Clearwater International

- Clearwater International works with *mergers and acquisitions* in 36 countries worldwide.
- The company has more than 275 employees worldwide (including 45 in Denmark).



# Troldtekt and Cradle to Cradle

In the following pages, you can read more about Troldtekt's strategic work with the Cradle to Cradle sustainable design concept.

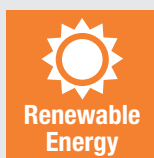
Read about milestones, ambitions and concrete 2021 activities within Cradle to Cradle's five categories of criteria:



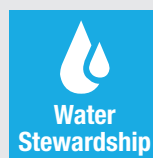
Material health



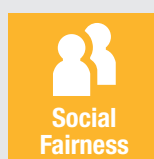
Material reutilisation



Renewable energy



Water stewardship



Social fairness



Material  
health

Material health:

# Part of the backbone of the circular economy

Healthy materials are essential for human well-being – and for materials to form part of healthy cycles. Troldekt cement-bonded wood wool has advanced to Cradle to Cradle's highest level of material health.

Most north Europeans spend 80-90 per cent of their time indoors. A healthy indoor climate is therefore of the utmost importance to their well-being and health. A WHO study has shown that we are primarily exposed to air pollution while spending time inside. Children are particularly exposed, as they have a higher breathing volume, and thus breathe in larger volumes of air than adults.

The use of healthy materials plays an important role, not only during the use of buildings, but also when materials need to be recycled at the end of their useful lives. Material health is a prerequisite for products being integrated into biological and technical cycles. And healthy cycles constitute the backbone of the circular economy. This is precisely why material health is a key category in the Cradle to Cradle certification.

As part of Troldekt's Cradle to Cradle certification, our products are thoroughly analysed. All materials are defined down to 100 parts per million (ppm) and assessed for their impact on people and the environment. The analysis is carried out in collaboration with Vugge til Vugge Danmark, the accredited assessment body under the Cradle to Cradle Products Innovation Institute.

## An indoor climate with no harmful chemicals

In practice, we know all the ingredients contained in our products down to 100 parts per million. We therefore have documentation to prove that they contain no substances that are considered harmful to humans or the environment. Both Troldekt acoustic panels in



natural wood/natural grey and painted in the standard colours white, grey and black have attained the highest level of certification – Platinum – in the Cradle to Cradle material health category.

The basic recipe for Troldekt acoustic panels – wood and cement – is in itself healthy. Wood is a natural material, and using cement as a binder ensures natural strength, as well as a high degree of fire protection without the addition of harmful chemicals.

Troldekt cement-bonded wood wool therefore also contributes to a healthy indoor climate in buildings and is indoor climate-labelled in the best categories for degassing and particle release according to Danish Indoor Climate Labelling. In addition, Troldekt has achieved an Allergy Friendly Product Award from Allergy UK and an M1 certificate from the Finnish Indoor Air Association as well as qualifying for the Swedish SundaHus ecolabel.

We have transferred the healthy properties to our new acoustic

panels based on the cement type FUTURECEM™, which we developed in 2021. The advantage of Troldekt based on FUTURECEM is a significantly lower carbon footprint. In fact, the panels absorb more CO<sub>2</sub> than they emit when factoring in raw materials, raw material transport and manufacturing.

Even before the launch of the new panels, we arranged for an independent assessment of the panels in 2021 to ensure that they would be granted the same Cradle to Cradle certification as Troldekt based on traditional cement. So the material health of the new panels is at the same high level.

## New recipes are more sustainable

Our Platinum level certification for material health is the result of persistent and systematic efforts culminating in 2021 with the implementation of new paint recipes in our production. This paved the way for our acoustic panels advancing from Silver to Platinum in the material health category.



## Phase-out of decoration in the name of material health

Sometimes, living up to your Cradle to Cradle strategy requires you to step back from particular courses of action. An illustrative example is the phasing-out by Troldekt of the special product 'Troldekt decoration' in 2021 because the inks used to print images on the acoustic panels no longer meet our material health requirements.

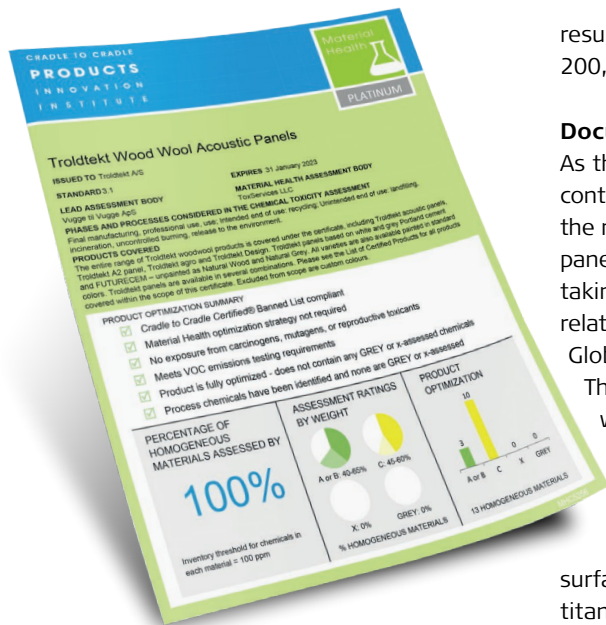
Paradoxically, this is essentially because our print supplier, the foil and sign manufacturer Nonbye, has

also moved in a more sustainable direction. Nonbye has replaced its printing inks with more environmentally friendly inks. However, the new inks require an even surface to dry – and thus harden – and this is not possible with the open structure of the Troldekt panels.

“Because of the roughness of the Troldekt panels, the printing inks we use today can't harden properly, and in principle there is thus a risk of the prints emitting chemical substances.

In consultation with us, Troldekt has therefore decided to phase out the option of having prints applied to the panels. And in a slightly topsy-turvy way, this is actually good news for the environment,” says Olafur Munk, Key Account Manager at Nonbye.

The Troldekt decoration solutions that have already been sold are not associated with any emission problems. They were printed using the old printing inks, which hardened well on rough surfaces.



result in additional waste of roughly 200,000 litres of paint a year.

### Documentation prior to action

As the paint recipes show, we are continuously working to strengthen the material health of our acoustic panels further. However, we are taking a precautionary approach in relation to Cradle to Cradle, the UN Global Compact and the UN's SDGs.

This means that every so often we decide to step back from particular courses of action.

Due to uncertainty about documentation, we have, for example, decided not to surface-treat our acoustic panels with titanium dioxide even though this could potentially contribute to photocatalysis and possibly removing NOx particles from the air. The EU suspects titanium dioxide of being carcinogenic when inhaled, and as material health is of paramount importance for Troldekt, we do not want to risk treating our panels in a way that may be harmful to humans or the environment. Titanium dioxide is also found in wall paint, but here the substance is inactive, and bound in the dry paint, so it does not pose any health risk.

In addition to the uncertainty about possible health risks, photocatalysis requires a lot of light to activate the titanium dioxide. Daylight does not fall on ceilings, and the client would therefore have to make significant investments in lighting to activate the

photocatalysis. Finally, it would seem that ventilation and conventional airing are much better for the indoor climate. We sell the solution Troldekt ventilation which has a documented effect in the form of lower CO<sub>2</sub> levels in the room. The result is improved learning for school children and a better indoor climate in offices, conference rooms and other environments where the air can often become stuffy.

### Assessment of procured goods

In our procurement of accessories to our acoustic panels, we also attach importance to material health. Our goal is that products manufactured by subcontractors as private label for Troldekt must carry the Cradle to Cradle Material Health Certificate.

In 2021, we updated the certification for the wooden strips for our design solution Troldekt contrast. The updated certification is based on a content analysis that is as detailed as the one performed for our Troldekt cement-bonded wood wool panels.

However, our focus on material health sometimes involves removing products from our product range or not adding them in the first place. For example, in 2021, we decided to phase out touch-up paint spray cans, and going forward we will only be selling touch-up paint in plastic containers. The reason is that the spray cans contain greenhouse gases that do not meet our material health criteria.



# New paint recipe has paved the way for certification at Gold level

Plant rather than fossil fuel-based raw materials and more sustainable preservatives. These are the main ingredients of a new type of paint from Masquelack which is making Troldekt acoustic panels even healthier.

In collaboration with the paint manufacturer Masquelack, in 2021, Troldekt developed a new paint recipe for the acoustic panels. In the new paints, many of the fossil fuel-based ingredients have been replaced with plant-based ingredients, while the preservatives are more environmentally friendly. And this was exactly what was needed for Troldekt acoustic panels to advance to Cradle to Cradle certification at Gold level.

Carsten Lauth, Sales Director at Masquelack Denmark, explains that many companies are making natural and completely reasonable demands on the chemical industry which of course includes paint manufacturers. The desire is to implement more sustainable products that leave less of an impact on the environment. Troldekt's new paint recipe is leading the way in that it differs from conventional paint in two crucial ways.

"We still have to add preservatives to our paints – which means chemicals – as otherwise the paints would rot when stored, and a lot would go to waste. However, by means of modern conservation technology, we've developed more sustainable solutions. In addition, some of the ingredients typically used to manufacture paints are fossil fuel-based, like for example oil. In the new paint recipe from Masquelack, a large part of them have now been replaced with plant-based ingredients," says Carsten Lauth.

## Productive collaboration

Masquelack has calculated the carbon footprint in the production phase – cradle to gate – and shown that the carbon footprint from the new paint



recipe is clearly reduced compared to conventional paint types.

Developing the new paint has been an exciting – and very important – process for both parties. For Troldekt, testing of the new paint recipe was demanding, as all the tests had to be carried out in-between shifts in production in the early hours of the morning.

"Our collaboration with Troldekt has been positive and close. The

project has been demanding, but important for both of us. We've done lots of tests and have succeeded in developing a solid project that we're very happy with. We'll definitely see an increased use of plant-based ingredients in our paints in the coming years as this is enabled by further technological advances and the availability of even greener ingredients," says Carsten Lauth.

## Facts

- Masquelack is a family-owned company that originates from Barcelona. The European market accounts for 85 per cent of its business.
- Together with Troldekt, Masquelack has developed a new paint recipe based on a more environmentally friendly

conservation technology and in which a large share of the fossil fuel-based ingredients have been replaced with plant-based ones.

- Following the introduction of the new paint recipe, Troldekt has advanced from Silver to Platinum in the Cradle to Cradle material health category. Overall, this means that Troldekt acoustic panels have advanced from Silver to Gold certification.



# Reutilisation: Creates value in new cycles

At Trolldtekt, we sort our production waste into a number of fractions to create new value. Cement-bonded wood wool can be returned to the technical cycle as a raw material in new cement – and to the biological cycle as a nutrient.



The vision behind the Cradle to Cradle concept is a world without waste. In order to obtain Cradle to Cradle certification, a material must therefore be recyclable. For example, materials may be returned to a biological cycle as nutrients, or to a technical cycle as raw materials in a new product.

At Trolldtekt, we are recycling waste from our own production. And our ambition is to extend our efforts to also include end-of-life acoustic panels from buildings.

To ensure that our production waste is reutilised at the highest possible value level, we sort our waste into a number of fractions. This approach enables us

to work with different solutions in both the biological and technical cycles – and to regularly trial new models.

### Offcuts used for cement production

However, we have decided to focus especially on reutilisation in the technical cycle, as this will allow us to derive value from both production waste and end-of-life Trolldtekt acoustic panels from demolished buildings.

We are already working closely with Aalborg Portland on returning dust from our edging workshop to the technical cycle in their cement

production. Aalborg Portland's tankers collect the dust after having delivered cement to our factory. In practice, the wood component of the dust is used to replace fossil fuels in Aalborg Portland's cement production, while the cement in the dust is used as a raw material in new cement.

In 2021, we worked on ways of including broken and damaged panels from our production in the technical cycle at Aalborg Portland. However, crushing the discarded panels into sufficiently fine dust for it to be transported to Aalborg Portland in the empty cement tankers remains a challenge to be overcome. We are



working on alternative solutions that will make it possible to return this waste fraction also.

### **Pilot project involving end-of-life acoustic panels**

The ambition is for our cooperation with Aalborg Portland to be developed to also cover the demolition waste and construction waste that currently end up at the municipal recycling centres. This is a more complicated waste fraction as Troldekt cement-bonded wood wool has a long useful life, and end-of-life acoustic panels can therefore easily be 50-70 years old. Because we have no way of knowing whether the panels have been treated with harmful chemicals during that period, they cannot be returned to the biological cycle.

Cement production is a thermal process that renders harmless any surface treatments, and end-of-life Troldekt acoustic panels can therefore be added to Aalborg Portland's cement production without any problems.

The plan is for a pilot project with the Municipality of Ringkøbing-Skjern – and in the next phase with seven other Danish municipalities – to form the basis for us being able to scale up the scheme. However, we need to find the right logistics partners who can help collect cement-bonded wood wool from Danish recycling centres.

### **Analysed in detail**

Troldekt cement-bonded wood wool waste can be included in the biological cycle as a soil improver. The cement in Troldekt panels has a high limestone content which helps to neutralise the acids produced during composting. The wood in the panels is an organic material, and can help to prevent compost from compacting. This increases oxygenation in the composting process so that carbon and nutrients are recirculated.

The reason our production waste can be added to new biological cycles is because we know all the substances contained in our products – thanks to our Cradle to Cradle certification. An independent assessor has analysed Troldekt cement-bonded wood wool in detail (100 parts per million), and we therefore have documentation that Troldekt production waste can safely be returned to nature.

### **From waste to healthy ground cover**

In 2021, we worked with two local players – Sønderup Montage and Østergaard – who receive both bark from the debarking of logs at our factory and wet cement-bonded wood wool waste from our production. The wet waste consists of wood, cement and water, i.e. the mixture used to cast the acoustic panels.

Wet cement-bonded wood wool waste is mixed with bark and used as ground cover in woodlands, riding grounds and in stables. This helps to minimise the need for weed control, while also being a good footing material for the animals' hooves.

The bark is also used as biofuel by our partners, who in exchange supply wood pellets for our biomass boiler. Today, we cannot use the bark and slabwood in our own boiler, but we are planning an investment that will make it possible to crush the wood residues so we can use them ourselves.

### **Considerable environmental benefits from reutilisation**

There are considerable environmental benefits to be gained from returning Troldekt panels to either a biological or technical cycle rather than incinerating them.

Incineration should only be an option in cases where the only alternative is landfill which will always be the least environmentally friendly solution. Our existing partnerships – together with new methods and pilot projects – are therefore important elements in our work with the circular economy, the ambition being to ensure that Troldekt creates the greatest possible value in biological and technical cycles.

### **Recyclable packaging**

In addition to our focus on recycling cement-bonded wood wool waste, we also work to make it easier for our customers to recycle the packaging in which Troldekt acoustic panels are delivered. In 2021, we replaced the foil so that the pallets are now wrapped in clear foil without printed logos. This increases the scope for recycling the foil.

In 2021, we also replaced the chipwood pallets on which several of our products were delivered with reinforced wooden pallets. This makes the pallets more stable when moved around by forklift trucks, in addition to which the wooden pallets can be reused.





# Troldtekt switches to more recyclable packaging

Troldtekt acoustic panels are now delivered to customers on pallets wrapped in clear plastic foil. This increases the scope for recycling the foil.



When leaving our factory in Troldhede, pallets of Troldtekt acoustic panels are now wrapped in clear plastic foil without printed logos. This has increased the recycling value of the material compared to the white foil used before. Moreover, the clear foil contains recycled plastic.

“Our strategy is based on the Cradle to Cradle concept, for which recycling is a key element. We sort our production waste into a large number of fractions. But we would also like to enable recycling at a high value level on construction sites, and the recycling value of clear plastic without

printed logos is somewhat higher than the value of white plastic with a printed colour logo,” says Production Manager Orla Jepsen, Troldtekt.

“Moreover, the clear foil we buy from our supplier is made partly from recycled plastic. Together with our supplier, we hope to gradually be able to use 100 per cent recycled plastic,” he continues.

#### **Easier to check deliveries**

As an added benefit, the clear foil is significantly more elastic and therefore does not split so easily. The result is less waste at the factory.

At the same time, clear foil makes it easier for customers to see and check the acoustic panels before removing the packaging. To make up for the lack of printing on the foil, four protective corners run from top to bottom on each pallet carrying highly visible Troldtekt logos to make it easy to see which product is on the pallet. Moreover, a label will be affixed showing the name of the Troldtekt product.





# New EPDs ensure transparency and precision

Consultants and developers can download a number of new Environmental Product Declarations (EPDs) documenting the environmental impact of the various Trolldtekt products. EPDs with specific product data make it easier to make sustainable decisions, explains a consultant from Ramboll.



In 2021, Trolldtekt launched a series of new EPDs that provide insight into the combined environmental footprint of the different variants of Trolldtekt acoustic panels. This is very useful for consultants and developers wanting, for example, to certify the sustainability of a building.

"We're experiencing an increasing demand for building materials with EPDs. The *Global Warming Potential* of a product, more commonly known as its carbon footprint, is a key figure

that's based on a life cycle calculation. The demand for EPDs is bound to increase further once life cycle analyses hopefully become a legal requirement," says Mathilde Husted, a sustainability consultant with Ramboll.

She is referring to the fact that life cycle analyses (LCA) are expected to become required by law in the voluntary sustainability class in Denmark in 2023. For all buildings of more than 1,000 square metres in size, the LCAs must document emissions of less

than 12 kgs of CO<sub>2</sub>e per square metre per year.

### Important for materials used in large volumes

EPDs are already crucial to being granted sustainability certification of projects under recognised standards such as DGNB, LEED and BREEAM.

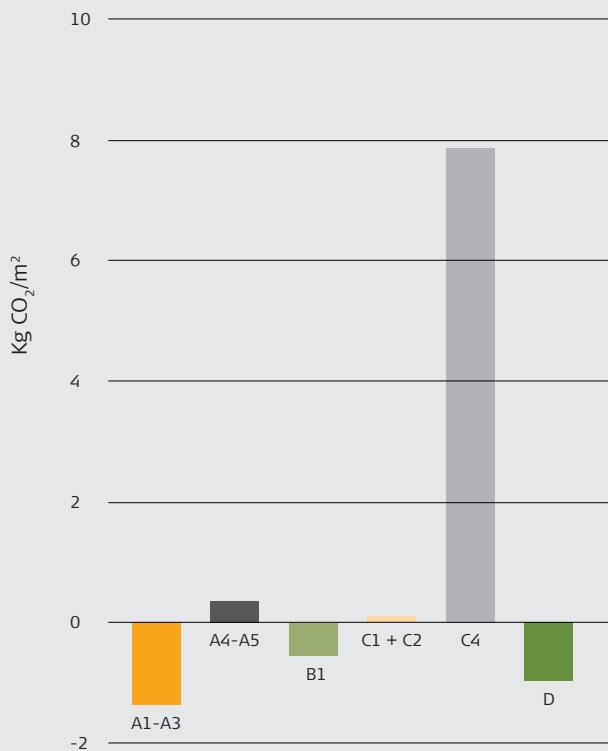
"To calculate a project's environmental footprint, we enter volumes and the weightings of the various materials. Based on the EPD data, we

# Complete overview of environmental footprint

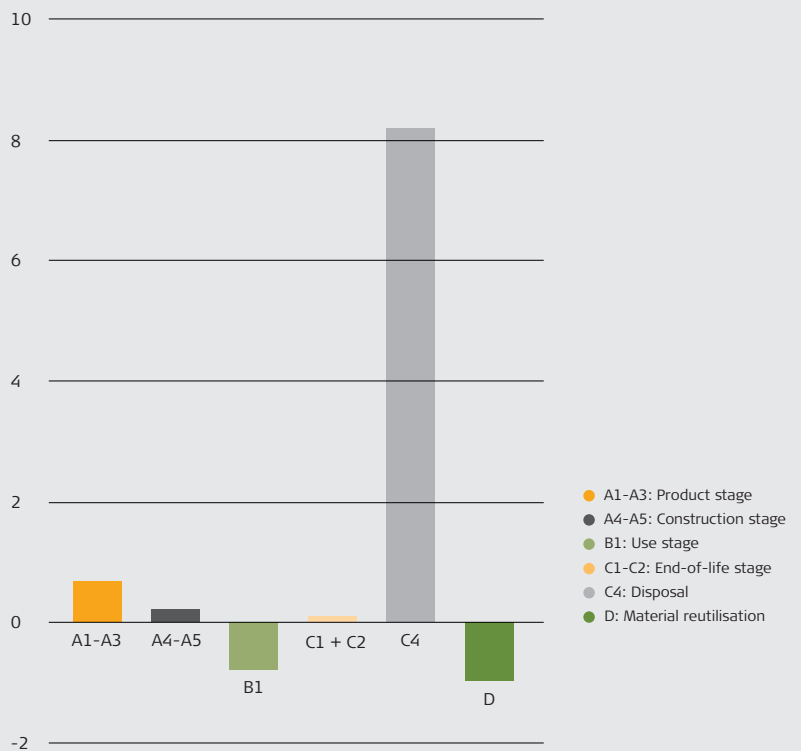
Troldtekt's EPDs cover phases A1-A3, A4-A5, B1, C1-C2, C4 and D. When comparing several products, it is important to conduct the assessment based on the same product stages.

Description of the system boundary (x = included in LCA; MND = module not declared; MNR = module not relevant)																
Product stage			Construction stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from gate to 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

Troldtekt based on FUTURECEM



Troldtekt based on grey cement



The graphs show the carbon footprint of Troldtekt acoustic panels based on either traditional grey cement or FUTURECEM in the various life cycle phases. FUTURECEM ensures a negative footprint in phases A1-A3, as the wood absorbs more CO<sub>2</sub> while the trees are growing than is emitted during the production of cement, raw material transport and production of the acoustic panels.

During use (stage B), the carbon footprint is negative for all Troldtekt acoustic panels because the panels absorb CO<sub>2</sub> via the chemical process of carbonatisation. And since the incineration of Troldtekt cement-bonded wood wool generates energy that can replace energy from fossil fuels, a negative carbon footprint has also been registered under recycling potential.



*Mathilde Husted, a sustainability consultant with Ramboll.*

can then see what difference it makes to choose one solution over another. Materials that are used in large volumes, such as concrete, insulation, ceilings and flooring, can make a substantial difference when analysing the data," says Mathilde Husted.

She explains that product-specific EPDs like the ones made available by Troldekt result in by far the most accurate calculations and thus create

the best basis for making sustainable decisions.

#### **A clearer picture**

The alternatives to product-specific EPDs are either industry-specific EPDs providing averages for the environmental impact of building materials that are typically used within a particular industry, or generic EPDs based on data from the ökobau.dat database.

"The generic EPDs can be used to quickly analyse whether it would make most sense to go for concrete,

wood or steel, for example. However, the available data is often outdated, for example because it's based on old production methods. So using product-specific EPDs like those made available by Troldekt will provide a much clearer picture for a particular project," says Mathilde Husted.

Due to the considerable uncertainties, it is a requirement for DGNB certification of a project that you multiply the available data by 1.1 or 1.3, respectively, if using industry-specific EPDs or generic data.

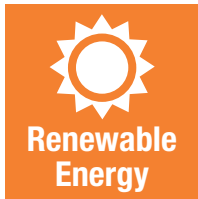
### Facts about Troldekt's EPDs

Rather than working with average values, Troldekt has had specific EPDs prepared for its individual acoustic solutions. This makes it easier for consultants to refer to product-specific data.

Troldekt's product-specific EPDs factor in:

- the thickness of the acoustic panels (25 mm or 35 mm)
- the cement used in the panels (white, grey or FUTURECEM)
- whether the panels are painted or unpainted
- the fire-protective properties of the panels.

All the EPDs have been verified and published by the German Institut Bauen und Umwelt e.V. (IBU).



Renewable energy:

# Factory is close to being carbon-neutral

Troldtekt is close to using 100 per cent renewable energy at its own factory, and with the introduction of a new type of cement, the carbon footprint of the sourced raw materials is also decreasing.

In the calculation of carbon 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 share of renewable energy in our own production (scope 1 and 2), so that the energy used comes almost exclusively from carbon-neutral energy sources. In the past couple of years, we have come close to 100 per cent – most recently with a slight increase to 97.8 per cent in 2021.

## Wind power and biomass

Since 2013, the electricity used in our production has come from wind power – more specifically Ørsted's offshore wind farm near Anholt. Troldtekt is an Ørsted Energy Climate Partner, which guarantees that one of Ørsted's certified wind farms produces electricity corresponding to our consumption. In this way, we have helped to increase the expansion of renewable energy in Denmark.

Today, most of Denmark's electricity consumption comes from wind power. This also means that we need to buy certificates for a smaller proportion of our electricity consumption than previously in order to realise 100 per cent wind energy.

As regards our heat supply, we are also committed to minimising the use of fossil energy sources. Our own biomass boiler supplies heat for our

production, and at our own factory site we have replaced gas and diesel-powered vehicles with electric trucks.

Finally, in 2021 we installed the first charging points for electric cars at our factory. More will be installed in 2022.

## Less energy consumption per unit

In recent years, we have increased our energy efficiency by investing heavily in new technology. Our new production line, which was ready for use in 2019, has made a marked difference, and an upgrade of our existing production line has benefited both the environment and our operating economy.

Compared to 2019, we have reduced our energy consumption per acoustic panel by 10.5 per cent, and since the start of our investment programme in 2017, we have achieved a total reduction of 29.2 per cent per acoustic panel. This is, among other things, ascribable to the highly efficient ovens that we use to dry the acoustic panels.

## Quantum leap for cement

While we have succeeded in reducing our scope 1 and 2 emissions, reducing scope 3 emissions has been harder. Cement accounts for virtually all our scope 3 emissions. It is 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. The dilemma is that cement production traditionally emits a lot of CO<sub>2</sub>.

However, together with Aalborg Portland, which supplies all our cement, we took a significant step in the right direction in 2021. The newly

developed cement type FUTURECEM has enabled us – at a stroke – to significantly cut CO<sub>2</sub> emissions per acoustic panel.

## Negative carbon footprint during production

In fact, Troldtekt panels based on FUTURECEM have a negative carbon footprint when measuring raw materials, raw material transport and manufacturing. The explanation is that the wood, which is the other raw material in Troldtekt acoustic panels, absorbs more CO<sub>2</sub> while the trees are growing than is emitted during the production of FUTURECEM. As our own production is based on renewable energy – and due also to the short transport distances to our factory – the carbon footprint in production is negative.

As a first step, by the end of 2021 we had launched acoustic panels in which FUTURECEM replaces traditional grey cement. We are now working on FUTURECEM also replacing the cement in the Troldtekt panels based on white cement. Here, the potential CO<sub>2</sub> reductions are even greater.

However, Aalborg Portland's ambitions do not stop here. By 2050, the company expects to reduce its carbon footprint by up to 70 per cent – among other things by switching to other fuels and modifying the chalk-based cement.

Apart from reducing the carbon footprint of cement, we are also looking into supplementing or completely replacing cement with alternative binders in the long term. In autumn 2021, we started investigating the potential of geopolymer binder.



# Aalborg Portland: How we developed new type of cement

In 2021, Troldekt developed acoustic panels based on the new cement type FUTURECEM. The panels absorb more CO<sub>2</sub> than they emit during the production stage, and this is due, among other things, to the cement developed by Aalborg Portland.

Cement has many advantages, and at present, these properties are difficult to achieve using alternative binders. In Troldekt acoustic panels made of cement-bonded wood wool, the cement ensures strength, robustness and durability. The flipside is that cement production emits a lot of CO<sub>2</sub>.

The launch of FUTURECEM by Aalborg Portland was therefore a groundbreaking development. The new type of cement has the properties of traditional cement – but with a 30 per cent lower climate footprint.

“At Aalborg Portland, we believe that this type of cement is the future, as reflected in the name of the cement,” says Michael Lundgaard Thomsen, CEO of Aalborg Portland.

## Replacing clinker

The high carbon emissions from cement production are explained by the fact that the production process

involves heating a number of solids to very high temperatures in a kiln to make cement clinker. The process is also called calcination and releases the CO<sub>2</sub> that is naturally bound in the chalk. For the same reason, the calcination process accounts for just over half of the climate footprint of cement.

“There’s no way of reducing the footprint from the calcination process, but we can instead try to reduce the amount of cement clinker in the finished cement,” explains Michael Lundgaard Thomsen.

Traditionally, however, it has not been possible to replace much of the clinker without affecting the strength of the cement. In so-called BASIS cement, 15 per cent of the clinker has been replaced with limestone filler, but it is difficult to add more filler without compromising on strength. The same would be the case if clinker were replaced with burnt clay.



*Michael Lundgaard Thomsen, CEO of Aalborg Portland.*



## FACTS: Aalborg Portland's climate ambitions

- Aalborg Portland's ambition is for its cement production to be one of the most sustainable in the world.
- The company's plan is described in its 'Roadmap for sustainable cement production in Denmark'.
- The vision is to supply carbon-neutral cement by 2030.
- By 2050, all cement production in Denmark must be carbon-neutral.



“Another challenge with finding replacement materials for clinker is that the alternatives must be available in sufficiently large quantities to guarantee supplies for years to come,” explains Michael Lundgaard Thomsen.

**Synergies between limestone and clay**

The breakthrough came when Aalborg Portland started to combine limestone filler and burnt clay. Because while it was not possible for the two materials to replace much of the cement clinker content on their own, mixing burnt

clay and limestone filler produced quite a different picture:

“The synergies between limestone filler and burnt clay result in a high level of strength,” explains Michael Lundgaard Thomsen.

This means that 35 per cent of the clinker in the cement can now be replaced with limestone filler and burnt clay, and the strength of the cement remains on a par with that of traditional cement.

“Globally, we’re looking at huge deposits of limestone and clay, so with FUTURECEM we have a technology that

produces the same strength based on materials that will be in plenty supply in the coming years,” he says.

**Alternative fuels and carbon capture**

However, Aalborg Portland’s efforts to reduce CO<sub>2</sub> emissions from cement do not stop here. According to its ‘Roadmap for sustainable cement production in Denmark’, the company aims to reduce its emissions by 30 per cent by 2030.

“We want to achieve this partly by developing new types of cement such as FUTURECEM, but also by switching to alternative fuels in our production,” says Michael Lundgaard Thomsen.

By 2050, Aalborg Portland expects to succeed in reducing its climate footprint by an impressive 70 per cent by switching to alternative fuels and modifying its chalk-based cement.

“But even with 100 per cent carbon-neutral fuels, we’re still going to have to look at carbon capture, whereby CO<sub>2</sub> from our production process can be captured and either used for other purposes or stored. However, it’s still early days for this technology,” he says.

Together with Aalborg University and other partners, Aalborg Portland has been granted EUDP funding to explore the potentials of carbon capture.

**New project investigates alternative to cement**

By replacing traditional cement with the new cement type FUTURECEM, we can significantly minimise the carbon footprint of Troldekt acoustic panels. But at the same time, we are exploring ways of completely replacing the cement with alternatives in the long term.

In autumn 2021, Troldekt started looking into the potential of geopolymer binder. The project is being undertaken in collaboration with the Danish Institute of Fire and Security Technology (DBI) with funding from Innovation Fund Denmark.

Vibeke Pedersen, Head of Engineering at Troldekt, elaborates:

“Geopolymer chemistry is a well-known technology which is thought to have been used to build the Egyptian pyramids and the Pantheon. It’s not based

on chalk, but on silica/alumina compounds, which are found in ash from biomass, for example. Through such upcycling, geopolymer binder could lead to significantly lower carbon emissions compared to traditional cement. In this new project, we’ll find out whether it’s possible to use geopolymer as a raw material in Troldekt acoustic panels, and what it will take.”

“Cement is difficult to replace because it makes our acoustic panels naturally strong while ensuring a long service life of 50-70 years and being able to withstand up to 100 per cent humidity. It’s also the cement that makes the panels fireproof without the need to use fire retardants or other hazardous chemicals. We’re very excited to find out whether geopolymer can confer the same properties,” says Vibeke Pedersen.



Water:

# Ready for the climate of the future

We support the Cradle to Cradle principles of responsible water management. Among other things, by establishing rainwater basins that also support biodiversity.



In western Jutland, where our production of Troldekt acoustic solutions is based, there is no shortage of water, but there is globally. We are therefore also working to protect our groundwater – not least at a time when torrential downpours are becoming more frequent in Denmark.

The separation of rainwater and waste water at our factory site ensures that heavy rains do not overwhelm the local sewer system. In addition, in 2021, we established an overflow basin – a so-called rainwater lake – in connection with the construction of our new storage and logistics facility. The lake is screened by planting.

The lake serves multiple purposes. First of all, it collects surface water from the roof of the new facility, which thus does not end up in the sewer system. This means that the

water level in the lake rises and falls depending on precipitation at different times of the year. Even during spells of dry weather, there will be water at the bottom of the lake, and during the droughts in 2021 a rich and varied birdlife flocked to the lake to quench their thirst.

### Insects checking in

A number of other features have been established around the lake to help support biodiversity. Wildflowers and a variety of native plant species have been planted that make good food sources for bees and other Danish insects. As a result, swarms of insects are often observed in the area.

Moreover, we have built an insect hotel – a nice home-made habitat for insects. They can use the hotel for winter hibernation and as breeding

and hiding places. The insect hotel helps to attract beneficial insects and thus improve the ecological balance. For example, many species of butterflies seek shelter in strong winds, and several species such as the brimstone butterfly, the peacock butterfly and the small tortoiseshell butterfly spend the winter there.

In addition, we have erected posts with bird boxes for starlings which are currently in decline across much of northern and western Europe, partly because of a lack of breeding areas.

In connection with future construction projects – including both an additional factory and a new welfare building on our factory site – we will be establishing more green 'oases' for collecting water and promoting biodiversity.

**Social  
Fairness**

## Social fairness: A positive role in society

Social fairness is one of Trolldtekt's three fundamental values. This is reflected, among other things, in our focus on the working environment and in our support for the local environment and associations.



At Trolldtekt, we are committed to playing a positive role in society and treating our surroundings with respect. This applies internally in our organisation, where we work to provide safe and healthy working conditions for all our colleagues. And it is evident in our support for the local community, local associations and forums that work to promote circularity in the construction industry.

### **Local involvement and support for associations**

We are aware that Trolldtekt as a company plays a major role for the local

community in Trolldhede, where our production is based. And we want to play an active role.

We do so by trying to minimise any inconveniences for our neighbours, and we have, among other things, invested millions to reduce the amount of dust and noise from our factory site. Moreover, we support local associations and new initiatives that contribute to making the town of Trolldhede an attractive place to live and work – both for those already living in Trolldhede and for potential newcomers to the area.

Among other things, in 2021, we sponsored a new speaker system for

the local community and sports centre Trolldhede Hallen and also made a donation towards the creation of a large activity area for children, young people and the elderly in the centre of town.

We have also helped to support initiatives in other parts of Denmark. For example, when the BYGGERI'20 trade fair was cancelled due to corona, we decided to donate the design panels from our stand – in combination with another donation of a free Trolldtekt acoustic ceiling – to the associations Furniture Stations in Tarm in western Jutland and the





sports club Birkelse IF in northern Jutland.

### Improved working environment

In recent years, our facilities in Troldhede have been extended significantly, while also undergoing thorough modernisation. The investments are also helping to ensure a better working environment. Today, virtually all the processes involved in the production of Troldtekt acoustic panels have been automated which has done away with manual routines and heavy lifting.

Recent initiatives include a jib crane for handling the heavy paint buckets containing our special paints, a switch to quiet electric pumps in the painting booth and the automated separation-out of defective panels.

At the same time, we focus on minimising noise and dust nuisances as much as possible – for the sake both of our employees and of our neighbours in Troldhede. In the new production line, for example, noise screens have been installed around the motors that power the ventilation system.

### An inclusive workplace

A second and important aspect of our CSR work is that we are consciously taking responsibility for inclusion in the labour market. Initiatives have included the job-trialling of a number of unemployed men and women – several of whom have subsequently been offered permanent employment as flexijobbers.

We cooperate with the Danish Association of the Hard of Hearing and the Castberggård job and development centre, which both want to see more people who are hearing-impaired in work. People who are partially deaf, in particular, need to work in environments with good acoustics – and so there is an obvious link between hearing problems and Troldtekt acoustic solutions.

In 2018, we took on a deaf colleague in a position on completely normal terms, and he is still working for Troldtekt. Since then, we have offered traineeships and project employment to other deaf colleagues.

### Space for tomorrow's workforce

In addition to our focus on inclusion, we also help to educate young people and prepare them for working life. In Denmark, there is generally a shortage of apprenticeships and traineeships, and this may be storing up problems for the future both for us and other Danish companies in the form of shortages of competent, skilled workers.

At Troldtekt, we continually employ apprentices and adult apprentices in our production, and we regularly employ office trainees at our head office.

### A chance to learn

We believe that colleagues who have been in the labour market for many years should also be able to upgrade their qualifications while employed by Troldtekt. Supplementary education and training for our colleagues also benefit our customers.

In 2021, for example, we invested in sustainability training for our German sales team and four employees in our Engineering department. The training consisted of two workshops in Hamburg held by the consultancy firm Drees & Sommer, and a third workshop is planned for 2022.

EPEA is part of Drees & Sommer and works with Cradle to Cradle research and consultancy. EPEA was founded by Cradle to Cradle co-founder Dr Michael Braungart.

The sustainability training in Germany was preceded by similar training of our Danish team which was undertaken by the engineering company Ekolab. The plan is to find a suitable partner to undertake similar training of our Swedish sales team.

### We share our knowledge

We are also contributing to educating and training players in the construction industry outside our own organisation – both directly by teaching courses and classes and indirectly by supporting students.

For example, our Sustainability and Communications Manager, Tina Snedker Kristensen, regularly teaches classes on the sustainable construction programme offered

by the knowledge centre Molio – Byggeriets Videnscenter. Here she teaches workshops on materials.

Moreover, we are always happy to help Danish or international students who are looking for sparring or knowledge for their study projects – typically in the sustainable building sphere. Finally, we support opportunities for students to develop their skills in the fields of activity on which we focus. For example, in 2021 we sponsored the German SCHULBAU fair's student awards. It was a chance for students of architecture and pedagogics to design a concept for a modern school building that supports new learning principles.

### Advancing the circular economy

Circularity is the focal point of Troldtekt's business strategy. It is therefore only natural for us to get involved in forums and committees working to advance the idea of the circular economy in the markets in which we are present. Among other things, we are a permanent sponsor of C2C NGO, which is based in Berlin. As a partner, we provide financial support for the NGO's efforts to promote Cradle to Cradle, and we also attend presentations and events where we share our experiences with the circular economy.

Moreover, we have contributed with Troldtekt acoustic panels to the newly opened C2C LAB in Berlin which is an educational centre, NGO office and 'living laboratory' for Cradle to Cradle-certified building materials.

In addition, Troldtekt is an active member of the following committees, among others:

- The Confederation of Danish Industry's special committee on waste and resources
- Danish Standards mirror committee S-878 on circular economy in construction
- European working group on suspended ceilings CEN/TC 277
- Danish Sound Cluster – a member forum for the Danish sound industry
- The German Netzwerk für Nachhaltige Unterrichtsgebäude



# New acoustic ceiling for community facility

For many years, the sports club Birkelse IF in northern Jutland had been dreaming of soundproofing the top floor of the clubhouse which is used for a multitude of activities and events. The dream came true when Troldekt donated an acoustic ceiling for the clubhouse. This has made an audible difference.



In 2021, the sports club Birkelse IF was one of the voluntary organisations nominated for the donation of a free Troldekt line design acoustic ceiling. The ceiling was part of the Troldekt stand designed for the BYGGERI'20 trade fair in Fredericia which was cancelled due to corona.

TV host and designer Søren Vester, who helped judge the nominations, did not think that the grey design

ceiling would go well with the sloping walls and dark floors of the clubhouse. However, with its story about the club's strong local roots, community spirit and the many volunteers who were ready to install the new ceiling themselves, Birkelse IF stood out a mile among the many nominees. Troldekt therefore decided to also donate a white Troldekt acoustic ceiling to the club to help fulfil its wish for good acoustics.

## **A true community centre**

Birkelse IF is like a centre for recreational pursuits in the town of Birkelse which include football for seniors and oldboys members of the club.

The clubhouse is situated right next to the sports hall and includes a large open-plan communal space with adjacent kitchen facilities. This is where people come together after training. Communal meals, general meetings and club parties are also



held here. Panoramic windows in the gable offer beautiful views of the playing fields.

In addition to sports activities, the clubhouse is used as a venue for private events, and the locals can rent it. In effect, the clubhouse serves as a kind of community centre, and given that it is booked two years into the future, it can only be said to be extremely popular with the locals.

### Hard surfaces and 'cold' sound

Due to the many different activities taking place in the clubhouse, the club had for a long time been dreaming of a new ceiling to improve the acoustics. However, given the many other maintenance jobs lined up and the club's modest budget, it was not a dream Birkelse IF would be able to realise on its own.

"The plastered ceilings and sloping walls produced a very cold soundscape," explains treasurer Bjarne Terkelsen, who was behind the nomination of Birkelse IF for Troldekt's donation.

He was overjoyed when he received the news that the club would be getting a new acoustic ceiling.

"Before, the acoustics were not only a problem when there were a lot of people in the room, but also when there were just a few people standing



around chatting. The sounds would be bouncing off the hard surfaces, and the carpet didn't really make much of a difference. Our members are mainly oldboys and seniors, and many have hearing impairments. Especially those with hearing aids didn't stand a chance, and most of them actually turned off their hearing aids when the noise became too overwhelming."

### Instant improvement

Following the installation of the new acoustic ceiling, the soundscape is completely different. "The sound is now both pleasant and warm," says Bjarne Terkelsen.

"You could feel the difference the minute the ceiling was up," adds Arne Jacobsen, who is a member of the sports club and who helped install the new ceiling.

The so-called C team took it upon themselves to install the new acoustic ceiling. The C team is made up of pensioners who are not active members of the club, but who are doing all they can to make sure it is attractive to new members. The ambition is to make Birkelse more attractive as a place to live for young families. Their next project is the establishment of a new multicourt as an extension to the sports hall.





# Flexijobbing at the factory in Trolldhede: Great for both parties

Majbritt Darva is a flexijobber at Trolldtekt's factory in Trolldhede, where she is responsible for keeping the floor areas clean. She loves her job, and she fulfils an important role at the factory.

Since June 2021, 37-year-old Majbritt Darva has been employed as a flexijobber at the factory in Trolldhede. She works 20 hours a week and spends four hours a day riding around on floor sweepers to make sure that the factory floors are neat and clean.

Majbritt Darva grew up in Trolldhede and moved back to her home town eighteen months ago when she and her husband bought a house in Trolldhede. Majbritt Darva, who is a flexijobber for mental reasons, is very happy with her job at the factory, and she has quite a big say in how she organises her working day.

"As a flexijobber, I have special needs, and Trolldtekt has been really good at accommodating them. During my first week, for example, one of the other employees showed me around, and since then I've been able to plan my working day myself. It's a good job and not very stressful, which is important for me to thrive," says Majbritt Darva.

## Trolldtekt in the backyard

Having grown up in Trolldhede, Majbritt Darva has always known about Trolldtekt, and her older brother even works in production, so it made perfect sense for her to apply for a job at the factory. And she has not regretted her decision for a minute.

"I think it's a great job. I've never worked at a factory before, but the job is perfect for me. I have my own daily routine so I can really just get on with doing my job in peace. Of course, there's always someone to talk to if I need to," says Majbritt Darva.

At the factory, they are very pleased that Majbritt Darva has come on



*Majbritt Darva is a flexijobber with Trolldtekt.*

board, and they try to create the best possible conditions for her.

"Majbritt Darva single-handedly makes sure that our floors are neat and tidy, and this is a huge bonus for us. We really value her as a colleague. As a flexijobber, you're just as much part of the team as everybody else. We value everyone's contribution," says Production Manager Orla Jepsen.

## What is a flexijobber?

- A flexijobber is an employee who works reduced hours and for whom special arrangements are made in consideration of their specific needs and working capacity.
- The working hours and tasks are tailored to the needs of the individual employee.
- At the end of 2021, Trolldtekt had four employees working on flexijobber terms.



# Troldtekt supports local sports and leisure activities

In 2021, Troldtekt made a financial contribution towards Troldhede's new activity area and the replacement of the speaker system in the sports hall. Both venues are important gathering places for the citizens of Troldhede.

Troldhede's new activity area – which has been named 'From 0 to 100 in 5 minutes' – is designed for all age groups and is one of the projects that received financial support from Troldtekt in 2021. The area includes a playground for small children, climbing frames for slightly older children and basketball and fitness facilities for all age groups.

The activity area has received funding from various foundations, and Troldtekt helped get the project off the ground with a donation of DKK 75,000.

"Troldhede was in need of a new activity area to replace the old playground, something which local families with children had been talking about for years. The activity area is also an important element in being able to attract more young families to Troldhede," explains Karin Neesgaard Nielsen, who has been in charge of the fundraising.

The activity area is situated close to the old station and the mound for tobogganing which Troldtekt incidentally also helped create, and within a short distance of Troldhede's residential districts.

"The activity area has become a gathering place for the whole town as it caters to a wide target group. Not only young children, but also teenagers and adults as well as the grandparents who enjoy watching their grandchildren play," says Karin Neesgaard Nielsen.

## **New speaker system for sports hall**

Another important gathering place in Troldhede is the sports hall which is a self-governing institution and therefore not eligible for public funding.



As the sports hall speaker system was no longer delivering a proper sound, Troldtekt sponsored the replacement of the defective parts in 2021. A local volunteer offered to repair and install the speaker system which now covers the 1,000 square metre sports hall without any problems.

"The speaker system is used almost every day of the year by the sports clubs using the hall. We've just had a gymnastics show, and a number of residential schools have been visiting to do a show as well. You really need proper sound to lay on these kinds of events. The music is a big part of the

experience. It was therefore crucial for us to get the speaker system up and running again, so we're extremely grateful for the support," says sports hall manager Sanni Møller Simonsen, before adding:

"The sports hall is a gathering place for Troldhede, and most locals come here at least once a week. It's important to the community."

In 2022, Troldhede Hallen has changed its name to Troldtekt Hallen following the conclusion of a three-year agreement with Troldtekt on financial support for the running of the sports hall.

# Our data

To ensure structured CSR reporting, Troldekt uses the international GRI G4 guidelines.

In 2018, the GRI G4 Guidelines were replaced by the GRI Standards. Troldekt's most recent CSR reports – including the CSR report for 2021 – have been structured in the same way as previous reports, which has resulted in a marked improvement in the quality of our content and data collection.



# Environment

Troldtekt remains a dynamic, growing company. We are seeing a marked increase in demand and thus increased production further in 2021.

The company's materials consumption data therefore shows an increase in the consumption of raw materials etc.

## Materials consumption

All materials are purchased from external suppliers. The data is compiled from supplier invoices or statements provided by suppliers.

	Material	2019	2020	2021	Unit	Renewable material
<b>Raw materials</b>	Wood	50,034	57,486	76,927	m <sup>3</sup>	yes
	Cement, grey	3,081	3,695	4,515	tonnes	no
	Cement, white	26,686	33,158	39,925	tonnes	no
	Cement FutureCem			40	tonnes	no
	Accelerator	382,350	439,804	343,348	litres	no
	Sodium silicate	266,229	422,132	445,400	litres	no
	Paint	603,112	713,273	994,702	litres	no
<b>Associated process materials</b>	Water	23,442	24,445	31,796	m <sup>3</sup>	yes
	Asphalt cleaner	280 *	4,236	6,923	litres	no
	Mould oil	141,361	165,467	209,512	litres	no
<b>Packaging</b>	Cardboard and paper	96	149	187	tonnes	yes
	Foil and other plastic packaging	43	35	70	tonnes	no
	Wood pallets	81,919	114,939	117,308	pcs	yes
	Pallet sheets			276	tonnes	no

\* In 2019, we reduced the consumption of asphalt cleaner through a change of application method. However, this did not work as intended, and we therefore had to go back to the original setup which resulted in an increase in consumption.

## Percentage of recycled materials

Material	2019	2020	2021
Total proportion of recycled materials as a percentage of total materials consumption	1.6%	1.6%	1.9%

Each Troldtekt panel contains cement, which is partially produced from recycled materials (the cement may contain ash and sand from offshore channels).

Recycled materials in grey cement: 16.09%, corresponding to 726 tonnes (588 tonnes in 2020).

Recycled materials in white cement: 2.05%, corresponding to 818 tonnes (458 tonnes in 2020).

### Energy consumption within the organisation

The tables below provide an overview of Troldekt's energy consumption in 2019-2021. Only energy consumption at the factory in Troldekte is included.

	2019	2020	2021
Energy consumption (GJ)	92,309	96,929	118,966
Percentage from renewable energy sources	96.2%	97.7%	97.8%

Consumption is distributed across the following entries:

	Quantity (GJ)			Share of total energy consumption			Share of renewable energy sources	Contributing to emissions	Produced externally/ internally
	2019	2020	2021	2019	2020	2021			
Electricity consumption	27,650	33,208	37,664	30%	34%	31.7%	100%	no	Externally
Biofuel	61,178	61,474	78,710	66.3%	63.4%	66.2%	100%	no	Externally
Oil for heating						0.0%	0%	yes	Externally
Gas (forklift trucks)	1,094	282	192	1.2%	0.3%	0.2%	0%	yes	Externally
Diesel (truck/wheel loader)	2,386	1,965	2,400	2.6%	2.0%	2.0%	0%	yes	Externally

Only energy consumption in Troldekte/production is calculated.

### Energy intensity

	2019	2020	2021
Energy consumption per m <sup>2</sup> of produced panel	21.95 MJ	19.83 MJ	19.65 MJ
The development affects Troldekte's environmental performance	Positively	Positively	Positively

The table 'Energy consumption within the organisation' lists which types of energy are included, and whether the energy is produced externally/internally.

### Reduction of energy consumption

	2019	2020	2021
Total energy savings	14,822 GJ	10,384 GJ	1,085 GJ

Total energy savings (savings per m<sup>2</sup> compared to the previous year, multiplied by number of m<sup>2</sup> produced this year). The reduced energy consumption reflects gains attributable to our new modern machinery as well as the continuous optimisation of operations.

### Direct CO<sub>2</sub> emissions (Scope 1)

The table presents an overview of direct CO<sub>2</sub> emissions from sources that are owned or controlled by Troldekte.

Direct sources of emissions	Tonnes CO <sub>2</sub>		
	2019	2020	2021
Biofuels for drying*	-	-	-
Gas for forklift trucks	70	18**	3**
Diesel for forklift trucks/wheel loader	165	122	163
Total	235	140	166

\* Biofuels are regarded as a CO<sub>2</sub>-neutral energy source.

\*\* The consumption of gas for forklift trucks is decreasing as we make the switch to electric trucks.



**Indirect CO<sub>2</sub> emissions (Scope 2)**

Indirect sources of CO <sub>2</sub> emissions	Tonnes CO <sub>2</sub>		
	2019	2020	2021
Electricity	0	0	0

Troldtekt uses 100 per cent wind power in the form of renewable energy from the Anholt Offshore Wind Farm (with Climate Investment).

**Other indirect CO<sub>2</sub> emissions (Scope 3)**

This indicator covers a number of other indirect emissions of CO<sub>2</sub> from sources that are not owned or controlled by Troldtekt, but where the CO<sub>2</sub> emissions result from the company's activities. CO<sub>2</sub> emissions from transport account for less than 0.5 per cent of total CO<sub>2</sub> emissions in Scope 3. In addition, this data is subject to considerable uncertainty. We have therefore decided not to include the CO<sub>2</sub> emissions stemming from transport in Scope 3.

Indirect sources of CO <sub>2</sub> emissions	Tonnes CO <sub>2</sub>		
	2019	2020	2021
Production of purchased process materials, raw materials and packaging	33,735	40,711	49,113

**CO<sub>2</sub> emissions intensity**

This shows the intensity of CO<sub>2</sub> emissions per produced square metre of acoustic panel, both in total and broken down according to the information from the three previous tables.

	Volume (tonnes)			Kg CO <sub>2</sub> /m <sup>2</sup>			The development affects Troldtekt's environmental performance
	2019	2020	2021	2019	2020	2021	
In Scope 1	235	140	166	0.06	0.03	0.03	Status quo
In Scope 2	-	-	-	-	-	-	Status quo
In Scope 3	33,735	40,711	49,113	8.02	8.33	8.11	Positively
Total CO <sub>2</sub>	33,970	40,851	49,280	8.08	8.36	8.14	Positively

**Reduction of greenhouse gas (GHG) emissions**

Increased production volumes, and hence increased consumption of cement, has led to an increase in total greenhouse gas emissions.

**Emissions of ozone-depleting substances**

This provides information about Troldtekt's emissions of ozone-depleting substances.

CFC-11 equivalent (kg)		
2019	2020	2021
0.0073	0.0086	0.0106

**SO<sub>x</sub>**

This shows Troldekt's discharges of SO<sub>x</sub>.

SO <sub>x</sub> equivalent (tonnes)		
2019	2020	2021
92.3	107.7	133.0

The increase in SO<sub>x</sub> emissions mirrors the increase in production.

**Total weight of waste by type and disposal method**

All waste disposal is carried out by approved suppliers. Waste data has been compiled and supplied by these suppliers.

Waste types	Volume (tonnes)			Treatment
	2019	2020	2021**	
Wood	93.5	100.3	137.2	Recycled
Packaging, plastic	5.8	6.4	7.1	Recycled
Packaging, cardboard	11.4	11.9	13.9	Recycled
LDPE agricultural film*	2.4	4.8	3.5	Recycled
Iron and metal	33.3	31.2	36.2	Recycled
Electronics	3.8	2.3	0.2	Recycled
Ash from biofuels	71.5	69.3	83.2	Recycled
Hazardous waste for reuse	23.1	1.1	2.8	Recycled
Wastewater from painting facility	596.0	653.4	702.3	Reutilisation/incineration
Hazardous waste for incineration	7.8	13.7	21.9	Incineration
Suitable for incineration	64.7	36.2	214.2	Incineration
Landfill	0.5	1.3	7.1	Landfill

\* We cover more wood supplies (piles of wood) with LDPE agricultural film.

\*\*Construction of a new loading facility resulted in an increased amount of waste, especially for incineration and landfill (from the construction process).

### Extent of mitigation of environmental impacts

- We have continued to invest massively in reducing noise levels in several places at the factory.
- Diesel and gas-powered forklift trucks have been replaced with electric trucks.

Percentage of products sold and packaging materials recycled

	2019	2020	2021
Wood pallets delivered (qty)	91,123	119,179	149,915
Wood pallets returned (qty)	19,733	24,824	32,657
Wood pallets returned (%)	22%	21%	22%

### Sanctions for non-compliance with environmental laws and regulations

Troldtekt has not been sanctioned for failing to comply with environmental laws and regulations in the reporting period.

### Percentage of screened suppliers – Environment

Troldtekt's Code of Conduct states that our suppliers must strive to minimise the environmental impact of their activities. They must also have procedures in place to effectively prevent and address any environmental issues and industrial accidents that may impact society and the environment.

All new Troldtekt suppliers must sign our Code of Conduct. Only if suppliers comply with the guidelines can they start doing business with us. We have been doing business with many of our suppliers for a number of years, and our supplier turnover is generally low.

Twenty-eight of Troldtekt's main product-related suppliers have signed Troldtekt's Code of Conduct. Approximately 90 per cent of our product-related purchases thus come from suppliers who have signed our Code of Conduct.

### Environmental impacts in the supply chain

No. of suppliers who have signed Troldtekt's CoC	Percentage categorised in low-risk group	Percentage categorised in medium-risk group	Percentage categorised in high-risk group
28	96%	4%	0%

All suppliers who have signed our Code of Conduct are categorised in low, medium or high-risk groups. The categorisation is based, among other things, on the specific risk of them having a negative environmental impact. We have no suppliers in the high-risk group. Should this happen in future, we will maintain our relations with such suppliers in order to exert a positive influence.

### Grievances about Troldtekt's environmental impacts

In 2021, we had several dialogues with both the environmental authorities and our neighbours concerning noise problems at our factory. We are always open to dialogue, and we will do our utmost to accommodate our neighbours' needs and wishes. Based on our dialogue, we have invested heavily in noise-reducing measures.

# Labour conditions

Troldtekt's employees are the company's most important asset. Consequently, their safety, health and rights are the foundation stone for our business. We are always seeking to further improve the working environment and make Troldtekt an even more attractive place to work.

Social fairness is not just a high priority for our own employees – it is also important that our suppliers treat their employees well. We ensure this through our Code of Conduct.

## Workforce and employee turnover

The table below is a summary of the number of employees and staff turnover in Troldhede and Tranbjerg, and the distribution of employees according to terms of employment. Please note that the table includes apprentices, flexijobbers and paid student interns, while young workers are not included.

Location	Age	Salaried employees		Hourly paid workers		New employees		Employees who have left Troldtekt	
		Women	Men	Women	Men	Women	Men	Women	Men
Tranbjerg	-30	1	1	0	0	0	1	0	0
	31-50	2	7	0	0	0	0	1	0
	51-	12	10	0	0	1	2	2	1
Troldhede	-30	0	0	1	6	0	6	0	3
	31-50	3	5	4	54	1	16	3	10
	51-	4	4	0	45	1	5	2	3

Employment	No. in Tranbjerg	No. in Troldhede
Full-time employees	29	122
Part-time employees, incl. flexijobbers	4	4
Permanent employees	32	126
Short-term contracts, including paid student interns	1	0
Total	33	126

Employees in subsidiaries are not included in the figures. Troldtekt GmbH has seven salaried employees. Troldtekt AB has four salaried employees.

## No. of employees on formal committees

In addition to the statutory occupational health and safety committee, Troldtekt has voluntarily set up a liaison committee. Both employees and the management are represented on both. Six per cent of our total workforce is represented on these formal health and safety committees in Troldtekt.

### Industrial accidents and absence due to illness

The figures cover the 110 hourly paid employees at the Troldekt factory in Troldekte. Absence due to illness among salaried employees is not fully registered, which is why we have chosen not to include this data in the table.

	2019	2020	2021
No. of lost-time injuries	5	4	6
Lost-time injury frequency (no. of industrial accidents/1 million hours worked)	36.92	28.45	30.90
Absence as a result of industrial accidents (hours/1,000 hours worked)	2.01	1.08	4.72
Absence due to illness, total (%)	2.63	6.08*	5.89*

\* The increase in absence due to illness is due to more employees being on long-term sick leave.

### Composition of senior employees according to gender and age

The following provides a summary of the composition of senior employees in Troldekt broken down by age and gender in per cent.

	Women < 30 yrs	Women 30-50 yrs	Women > 50 yrs	Men < 30 yrs	Men 30-50 yrs	Men > 50 yrs
No.	0	0	2	0	2	3
Distribution of senior employees in %	-	-	28.57	-	28.57	42.86

### Percentage of screened suppliers – Labour rights

According to Troldekt's Code of Conduct, our suppliers must comply with certain guidelines within the field of labour rights. Among other things, they must comply with local legislation concerning a minimum wage, and employees must be paid a wage which ensures them a fair standard of living. Employees must also have the right to paid holiday, absence due to illness, maternity/paternity leave and trade union membership. All new Troldekt suppliers must sign our Code of Conduct. Only if suppliers comply with the guidelines can they start doing business with us. We have been doing business with many of our suppliers for a number of years, and our supplier turnover is generally low.

Twenty-eight of Troldekt's main product-related suppliers have signed Troldekt's Code of Conduct. Approximately 90 per cent of our product-related purchases thus come from suppliers who have signed our Code of Conduct.

### Risk of negative labour practices in the supply chain

The status is that 96 per cent of suppliers who have signed our Code of Conduct are categorised in the low-risk group, and 4 per cent are in the medium-risk group, and there are no suppliers in the high-risk group.

A single supplier accounts for the 4 per cent categorised as medium-risk, being based in a country where good labour conditions are not enforced through statutory legislation. Troldekt has visited the supplier, and in this connection conducted a very satisfactory audit (on-site inspection).

There have been no incidents among Troldekt's suppliers which required reprimands or other measures.

# Society

At Troldekt, we want to make a positive contribution to the local communities in which we are present. We are continually engaged in close dialogue with local stakeholders. Moreover, we have established anti-corruption guidelines, and through thorough documentation we are doing everything in our power to make sure that our products contribute to the safety and health of our customers' buildings.

As market leader in Denmark within the production and supply of acoustic solutions, we want to lead the way and set a good example in terms of positively influencing society around us.

### Anti-corruption: Screened suppliers

Troldekt's suppliers must neither directly nor indirectly engage in or benefit from any form of corruption or bribery. This is stated in our Code of Conduct, which all new suppliers must sign before they can start doing business with us. We have been doing business with many of our suppliers for a number of years, and supplier turnover is generally low.

Twenty-eight of our main product-related suppliers have signed our Code of Conduct. Together, the 28 suppliers represent approximately 90 per cent of our product-related procurement volumes.

### Anti-corruption guidelines

All Troldekt's employees are informed about our CSR policy at canteen meetings, and the CSR policy is included in our staff manual. All employees have been informed about this.

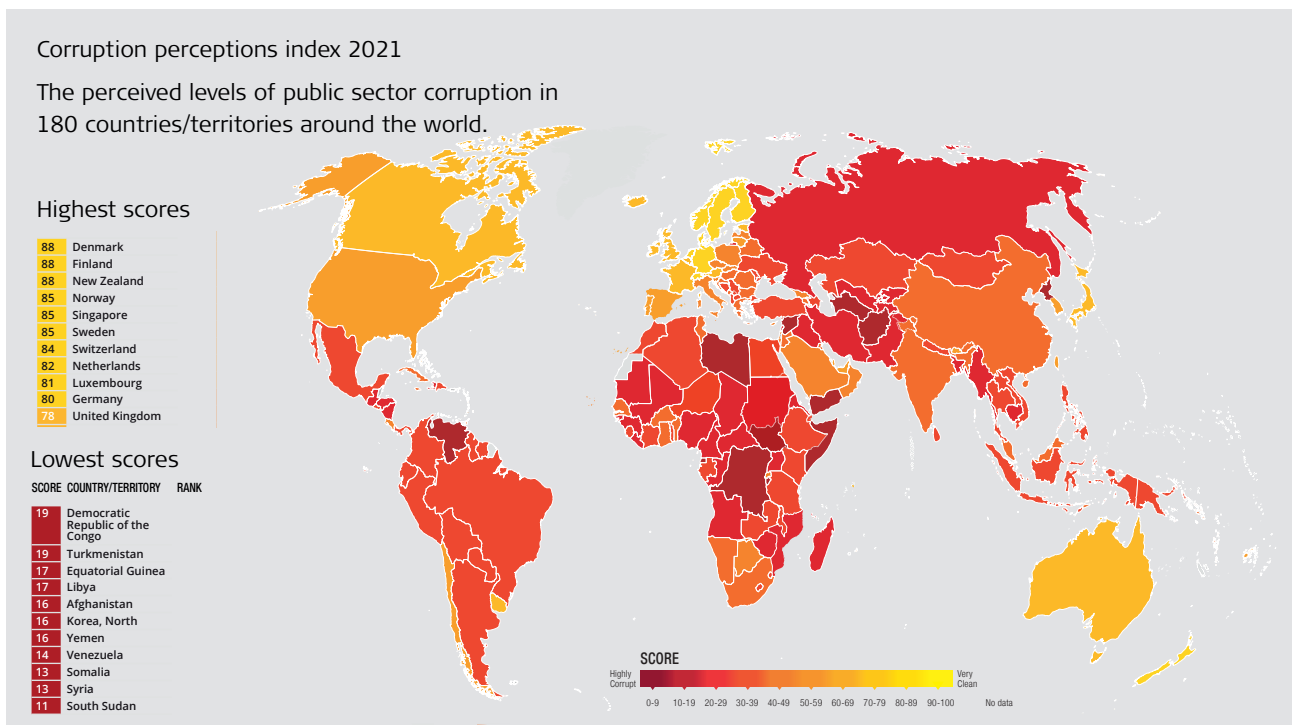
Moreover, all new employees are introduced to the company's anti-corruption guidelines.

Number of suppliers screened with CoC*	Percentage categorised in low-risk group	Percentage categorised in medium-risk group	Percentage categorised in high-risk group
28	96%	4%	0%

\* The figures are rounded off.

### Cases of corruption or bribery

No cases of corruption or bribery were identified at Troldekt in 2021.



**Sanctions for non-compliance with laws and regulations**

Troldtekt was not sanctioned for non-compliance with laws and regulations in 2021.

**Society: Screened suppliers**

Troldtekt's Code of Conduct provides guidelines for the company's cooperation with its suppliers, including criteria relating to their impact on society.

All new suppliers must sign our Code of Conduct before they can start doing business with us.

**Society: Risk classification of suppliers**

Twenty-seven of the 28 suppliers (corresponding to 96 per cent) who have signed our Code of Conduct are placed in the low-risk group, and one supplier (corresponding to 4 per cent) is placed in the medium-risk group. There are no suppliers in the high-risk group.

The supplier in the medium-risk group is based in a country where the impact of organisations on society are regulated by law. Troldtekt has visited the supplier, and in this connection conducted a very satisfactory audit (on-site inspection).

There have not been any incidents among Troldtekt's suppliers which required reprimands or other measures.

**Assessment of products**

Through our strategic work with Cradle to Cradle certifications, a thorough raw materials assessment has been carried out of Troldtekt's acoustic panels.

As a result of this assessment, we have phased out harmful substances, and Troldtekt acoustic panels are therefore Cradle to Cradle-certified – since March 2022 in the Gold category. The panels have also been recognised for their contribution to a healthy indoor climate and have, for example, been granted the Danish indoor climate label *Indeklimamærket*, the Finnish quality label M1 and Allergy UK's Allergy Friendly Product Award.

**Sanctions for non-compliance with laws and regulations concerning use of products**

Troldtekt was not sanctioned for non-compliance with laws and regulations concerning the provision and use of its products in 2021.

# Human rights

Troldtekt wishes to promote CSR in the construction industry. An important aspect of this work is supporting and promoting human rights. Troldtekt has also made a commitment to this through joining the UN Global Compact.

With our Code of Conduct, we want to help ensure that our product-related suppliers respect human rights.

**Risk of child labour**

Troldtekt deems there is no risk of child labour in our organisation. Through our Code of Conduct, we take an active approach to the elimination of child labour.

**Human rights: Screening of suppliers**

Troldtekt's suppliers must neither directly nor indirectly be involved in using child labour. This is stated more explicitly in our Code of Conduct, which all new suppliers must sign in order to start doing business with us.

**Human rights: Risk classification of suppliers**

Twenty-seven of the 28 suppliers (corresponding to 96 per cent) who have signed our Code of Conduct are placed in the low-risk group, and one supplier (corresponding to 4 per cent) is placed in the medium-risk group. There are no suppliers in the high-risk group.

The supplier in the medium-risk group is based in a country where there is a general risk that human rights are not respected. Troldtekt has visited the supplier, and in this connection conducted a very satisfactory audit (on-site inspection).

There have not been any incidents among Troldtekt's suppliers which required reprimands or other measures.

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## Status 2021

Category	Description of objectives	Status
General	Review suppliers in relation to the Code of Conduct, evaluate the current criteria for the classification of suppliers and implement a new risk assessment.	<p>Not realised.</p> <p>The process started up in the first half of the year, but was not completed as it was not possible to carry out supplier audits due to corona restrictions.</p> <p>In the second half of the year, the process was put on hold pending alignment with Troldekt's new owner's Code of Conduct.</p>
Environment	In connection with energy supervision, external consultants will go through all processes with the aim of identifying possibilities for utilising waste heat and water vapour as well as separating and reusing the water.	<p>Realised.</p> <p>A feasibility study has been carried out for the recovery of water vapour, and a sample module will be installed in 2022.</p>
Environment	Increase local supply of certified wood to further minimise transport. Partly through dialogue with nearby municipalities about certification, and partly by reassessing raw wood requirements, as our new machinery can handle wood in other dimensions and of different ages to what has so far been possible.	<p>Partially realised.</p> <p>Continued cooperation with FSC Denmark, for example on various events and seminars at the Municipality of Ringkøbing-Skjern and Innovest, among others.</p> <p>As regards the reassessment of raw wood requirements, trials involving an increase in dimensions have not increased the supply, so we are still looking into alternatives, including the possibility of changing the age requirements and of using other types of wood.</p>
Environment	Both paint suppliers supply paints that match Cradle to Cradle Platinum level for material health.	<p>Partially realised.</p> <p>One supplier now supplies paints that match Cradle to Cradle's Platinum level for material health – and this paint has been implemented in production. We are still working with one or more suppliers to increase security of supply.</p>
Environment	Reduce the carbon footprint from the production of acoustic panels, among other things through our cooperation with Aalborg Portland on the possibility of procuring cement with a lower footprint.	<p>Realised.</p> <p>Full-scale trial production with the cement type FUTURECEM™ has been carried out, and life cycle data (LCA) have been calculated and submitted for verification by Institut Bauen und Umwelt e.V.</p> <p>Acoustic panels based on FUTURECEM ready for launch in Q1 2022.</p>
Environment	Internal testing at Troldekt to facilitate take-back scheme for used cement-bonded wood wool panels ends Q3. In Q4, the timetable for a pilot project with the Municipality of Ringkøbing-Skjern will be defined, the plan being to introduce a take-back scheme for used cement-bonded wood wool panels in the Municipality of Ringkøbing-Skjern.	<p>Partially realised.</p> <p>Experiments involving the crushing of panels have been carried out with a view to more production waste being transported to Aalborg Portland in the empty cement tankers.</p> <p>The pilot project is now awaiting investment in equipment as well as dialogue with partners on, among other things, requirements as regards the purity of demolition waste.</p>
Environment	Minimise the amount of packaging waste on construction sites. Among other things, by phasing out chipboard and by reinforcing pallets to do away with the need for pallet sheets.	<p>Realised.</p> <p>Most panels, including all painted panels, are now delivered on reinforced pallets without pallet sheets.</p>

## Status 2021

Category	Description of objectives	Status
Labour conditions	Continued focus on safety. The goal is zero industrial accidents.	<p>Partially realised.</p> <p>We recorded six industrial accidents in 2021, which is two more than in 2020.</p> <p>Supplementary training has been initiated with a specific focus on the psychological working environment and behaviour in the workplace, which is the cause of several of the accidents. In addition, our internal training focuses on transport (truck driving).</p> <p>Due to the corona restrictions, completion of the supplementary training had to be postponed to 2022.</p>
Labour conditions	Hold inspirational presentations on stress management for all salaried employees.	<p>Not realised.</p> <p>Due to corona restrictions, it has not been possible to gather all salaried employees, but we are now considering an online solution.</p>
Society	Hold a refresher course on anti-corruption for employees for whom the topic is relevant. Courses will be recorded for use in connection with the onboarding of new employees.	<p>Not realised.</p> <p>Due to corona restrictions, it has not been possible to gather all salaried employees.</p> <p>The staff manual's guidelines on, among other things, anti-corruption are explained to all new employees, so it remains a focus area.</p>

## New objectives for 2022

New objectives have awaited finalisation of the agreement with a new owner of Troldekt A/S. The objectives will be defined in close cooperation with the Kingspan Group which from spring 2022 is the new owner of Troldekt. Kingspan works with the principles of circularity under the auspices of the group's Planet Passionate sustainability programme.

## Planet Passionate – more than 12 targets



**1.5°C**  
aligned strategy



ESG performance  
embedded into  
remuneration



**€50m**  
Green loan



Strategic pillar  
of our business  
model



Quarterly progress  
management  
reporting



Internal  
carbon price



**100 +**  
global team



Acquisition  
screening  
procedure



Champions  
network &  
education  
programme



**200 +**  
annual projects



Supplier  
engagement &  
collaboration  
programme



Planet Passionate  
communities



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**Troldtekt A/S**

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About Troldtekt

Troldtekt acoustic solutions for ceilings and walls are among the leading products for ensuring good acoustics, effective fire protection and a healthy indoor climate. The main product is Troldtekt acoustic panels made from the natural material wood as well as cement extracted from the Danish underground, and which are Cradle to Cradle-certified at Silver level. Troldtekt acoustic panels are the obvious choice for ceilings in most types of buildings – from offices and commercial buildings to schools, institutions, swimming pools, sports centres and private homes. Troldtekt A/S was founded in 1855 as a trading company in Aarhus. Since 1935, the company has produced Troldtekt cement-bonded wood wool in Troldhede in western Jutland.

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Certifications

