CRUZ FOAM

2024

Cruz Foam

In Circularity

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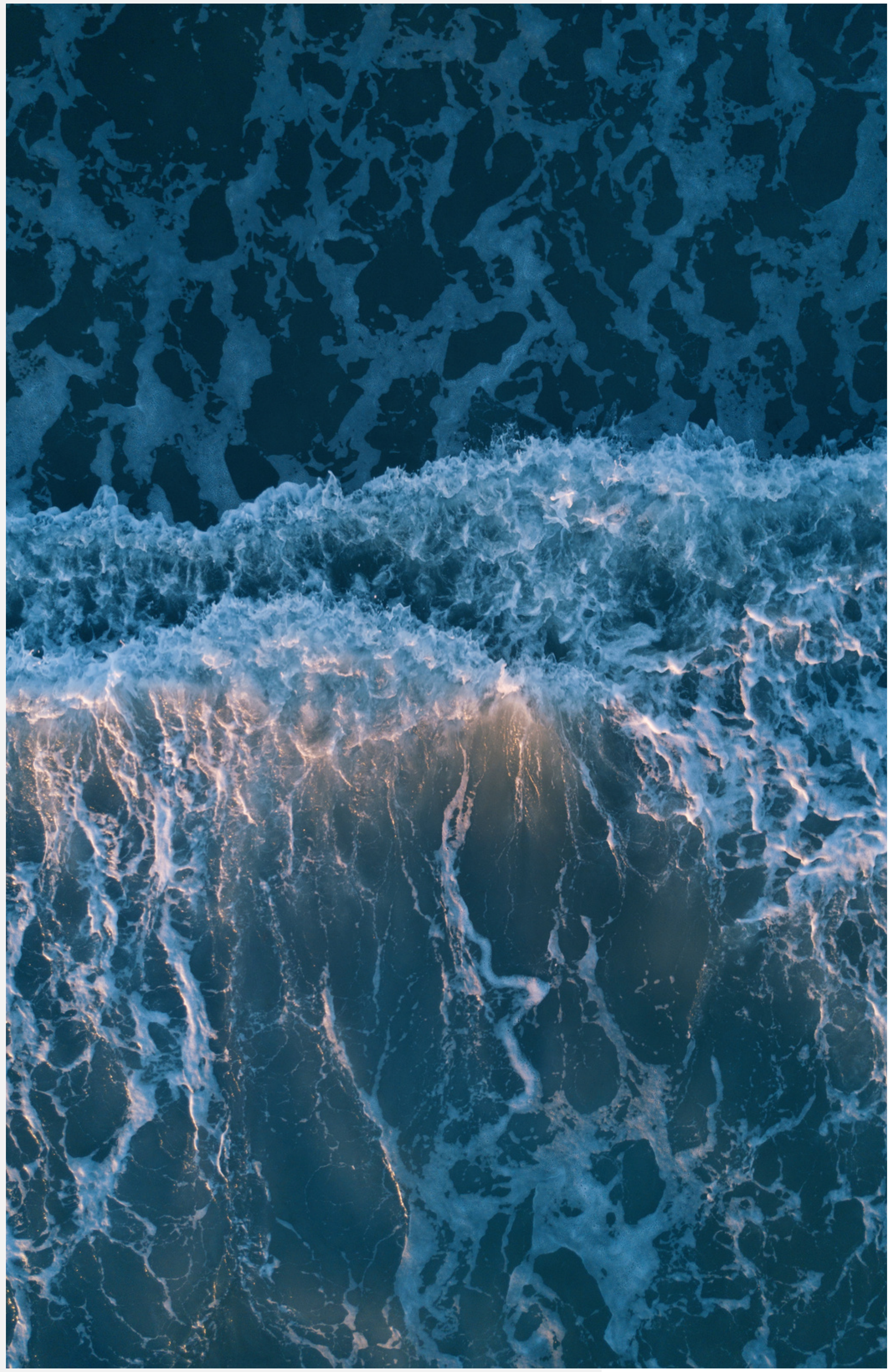


INTRODUCTION

At Cruz Foam we're on a mission to revolutionize the packaging industry by introducing circular materials that replace unsustainable conventional packaging products into the global supply chain.

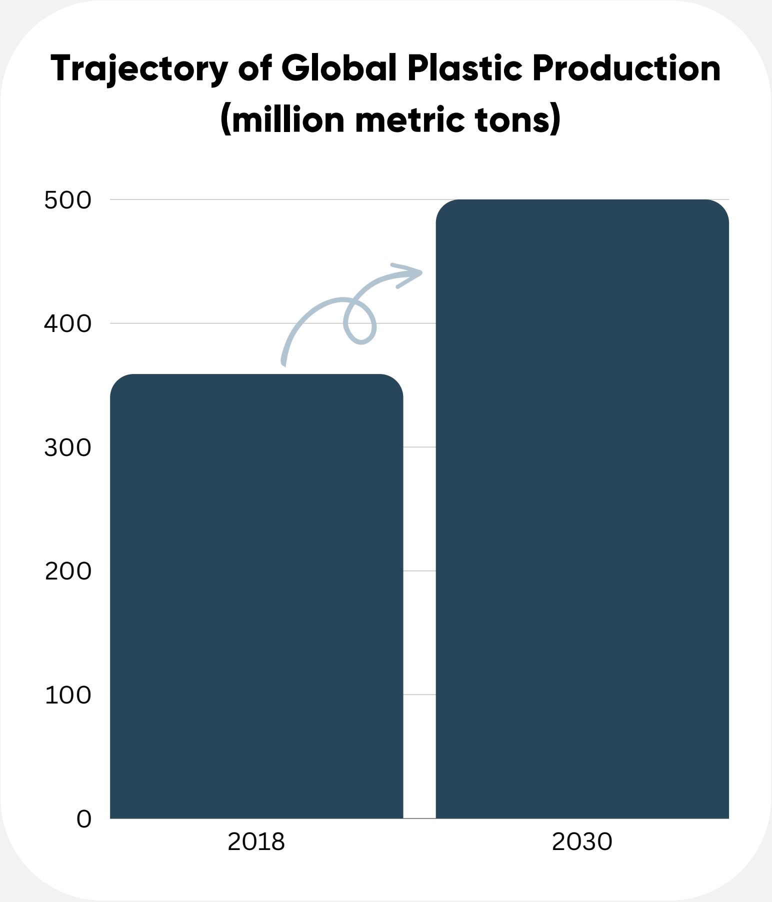
Our vision is to offer regenerative solutions, setting a new bar for packaging. We're dedicated to making a positive impact on the environment and reducing waste with our innovative products that reduce carbon emissions throughout their entire life cycle from ingredient sourcing to end-of-life. As our customers evaluate their sustainability goals along with their protective and insulative product packaging requirements, we aim to offer a new level of thoughtfulness and thoroughness in our solutions.

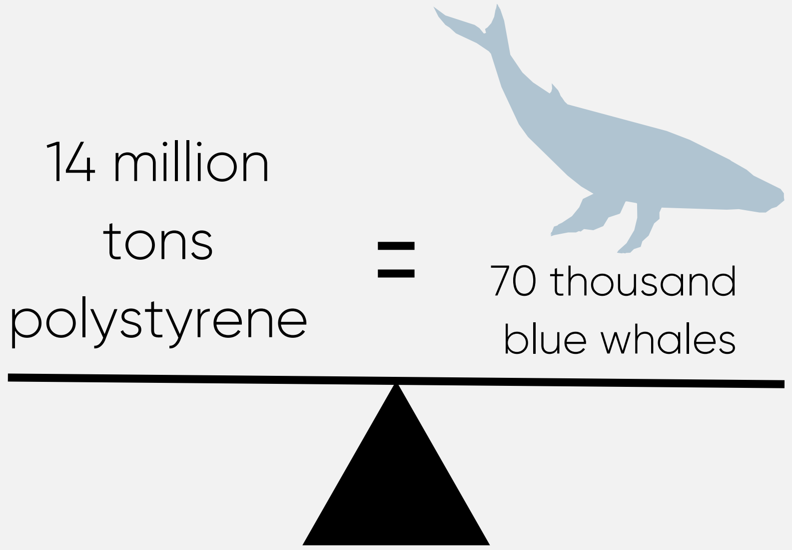
The State of Global Plastic Production

In 2018, global plastic production reached 359 million metric tons. If trends continue, global plastic production is on course to increase to 500 million metric tons per year by 2030. Our approach involves tackling the toughest challenges first, product by product. To achieve this, we're focused on developing tailored solutions that replace polystyrene foams one by one. By prioritizing the most difficult problems, we're able to make significant strides towards a more sustainable future, starting with the materials that have the largest negative impact.

According to a report published in 2020 by the World Economic Forum, plastic foam waste is one of the biggest environmental challenges we face today, with a significant portion of this waste coming from packaging materials used in e-commerce and “last mile” delivery. By focusing our efforts on these areas, we can work towards mitigating the harmful effects of foam waste and promoting a more sustainable future.

Each year, the world produces more than 14 million tons of polystyrene, the petroleum-based polymer used to make protective packaging foam or expanded polystyrene (EPS). While this material has highly effective insulative and protective properties, it is nearly impossible to recycle and takes at least 500 years to decompose. Almost all polystyrene is disposed of in landfills, or alternatively, directly into our waterways and other ecosystems. Because landfills create anaerobic environments, methanogenesis occurs (the formation of methane by methanogenic microbes in the absence of oxygen) and releases methane, a greenhouse gas more than 25 times more potent than carbon dioxide, into the atmosphere.





AS A COMPANY COMMITTED TO ENVIRONMENTAL PROTECTION, WE STRIVE TO MAKE A POSITIVE IMPACT ON THE NATURAL WORLD AND REDUCE PLASTIC WASTE WITH OUR INNOVATIVE PRODUCTS. THIS REPORT OUTLINES HOW WE ACHIEVE THESE OBJECTIVES.

Municipal solid waste (MSW) in United States landfills is the third largest source of human related methane emissions and makes up 15% of the methane released in the United States. In 2018 MSW included 27 million tons of plastic. It is estimated that expanded polystyrene (EPS) makes up about 30% of volume in landfills. The top figure illustrates how plastic waste was disposed of in 2018 and highlights the mounting problem of accumulation of plastics in landfills.

Landfills are nearing capacity which will increase tipping fees and further contribute to climate change and land use changes. The need for alternative packaging materials that integrate in harmony with our current ecosystems and can be broken down into secondary materials continues to grow.

Cruz Foam aims to fill this gap and address negative environmental impacts of packaging by providing bio-benign products that can be composted, or turned into energy through anaerobic digestion.

Derived from naturally occurring materials, Cruz Foam products are developed to provide protection and performance without the adverse impacts on our environment. Every Cruz Foam product compostable meaning nothing should go to landfill. In compost (home or industrial), standalone Cruz Foam will break down in approximately 100 days - without any ecotoxicity - all while adding nutrients to the end-market compost. Cruz Foam has passed ASTM D6400 and D5338 compostability testing, and is a biobased Product. Our materials biodegrade to produce high-quality organic waste, which can be used as nutrient-rich compost and biogas used for electricity.

Fate of US Plastics: 2018

8.6% Recycled | 15.8% Combusted | 75.6% Landfilled

214,000

Metric tons of EPS used in TV packaging in 2018

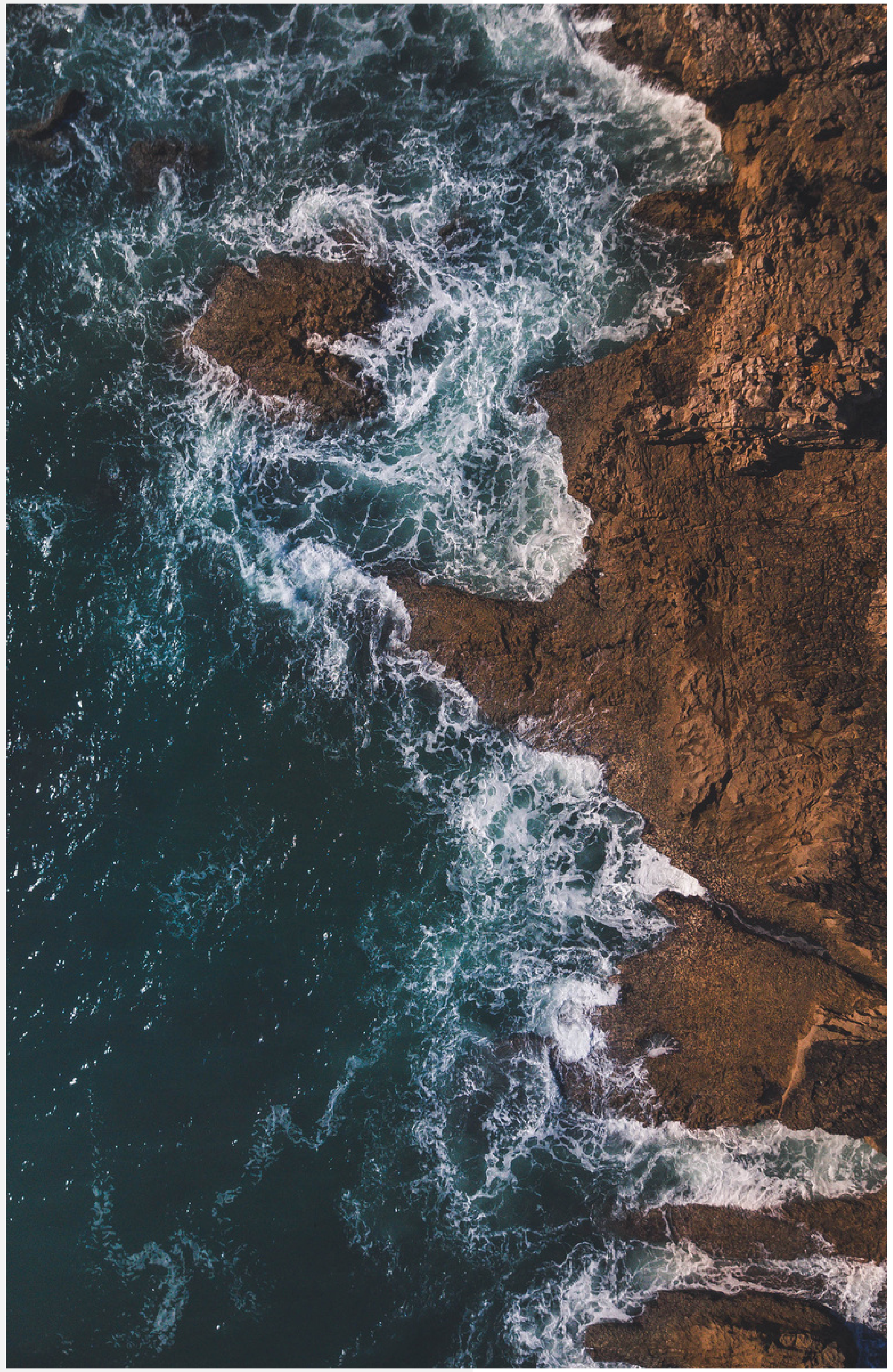
↓

That's enough EPS to cover

814 X **6**

Football fields | Inches deep

Our Environmental Footprint



To advance our mission to follow nature toward a more sustainable future, we needed to quantify our product's footprint. We utilized life cycle assessment to better understand our footprint and identify areas of improvement.

This LCA was done on the foam used in our first generation product line. A LCA on our second generation foam is in process.

What is a LCA?

A LCA is a universally recognized science and data-based tool used to evaluate the environmental impact of a product or process throughout its entire life cycle, from the extraction of raw materials to its disposal. The goal of a LCA is to identify and quantify the environmental impacts of a product or process in a comprehensive and objective way, taking into account all relevant stages of its life cycle, including:

- Raw material extraction and processing
- Manufacturing and assembly
- Packaging and distribution
- Use and maintenance
- End-of-life disposal

By analyzing these life cycle stages, a LCA helps identify the environmental "hotspots" of a product or process, where the largest environmental impacts occur.

This information can be used to inform stakeholder decision-making and point to opportunities for improving the sustainability of a product or process.

Life Cycle Assessment

1

Goal and scope definition
This involves defining the purpose of the study, the system boundaries, and the functional unit (i.e., the unit of measurement for the environmental impacts, such as per kilogram of product).

2

Inventory Analysis
This involves compiling a detailed inventory of all inputs and outputs associated with the product or process, including energy and material flows, emissions to air, water, and land, and waste generation.

3

Impact Assessment
This involves assessing the environmental impacts associated with the inputs and outputs identified in step 2, using established impact categories such as climate change, acidification, and eutrophication.

4

Interpretation
This involves interpreting the results of the LCA and drawing conclusions about the environmental performance of the product or process. This may include sensitivity analysis, uncertainty analysis, and comparison with alternative products or processes.

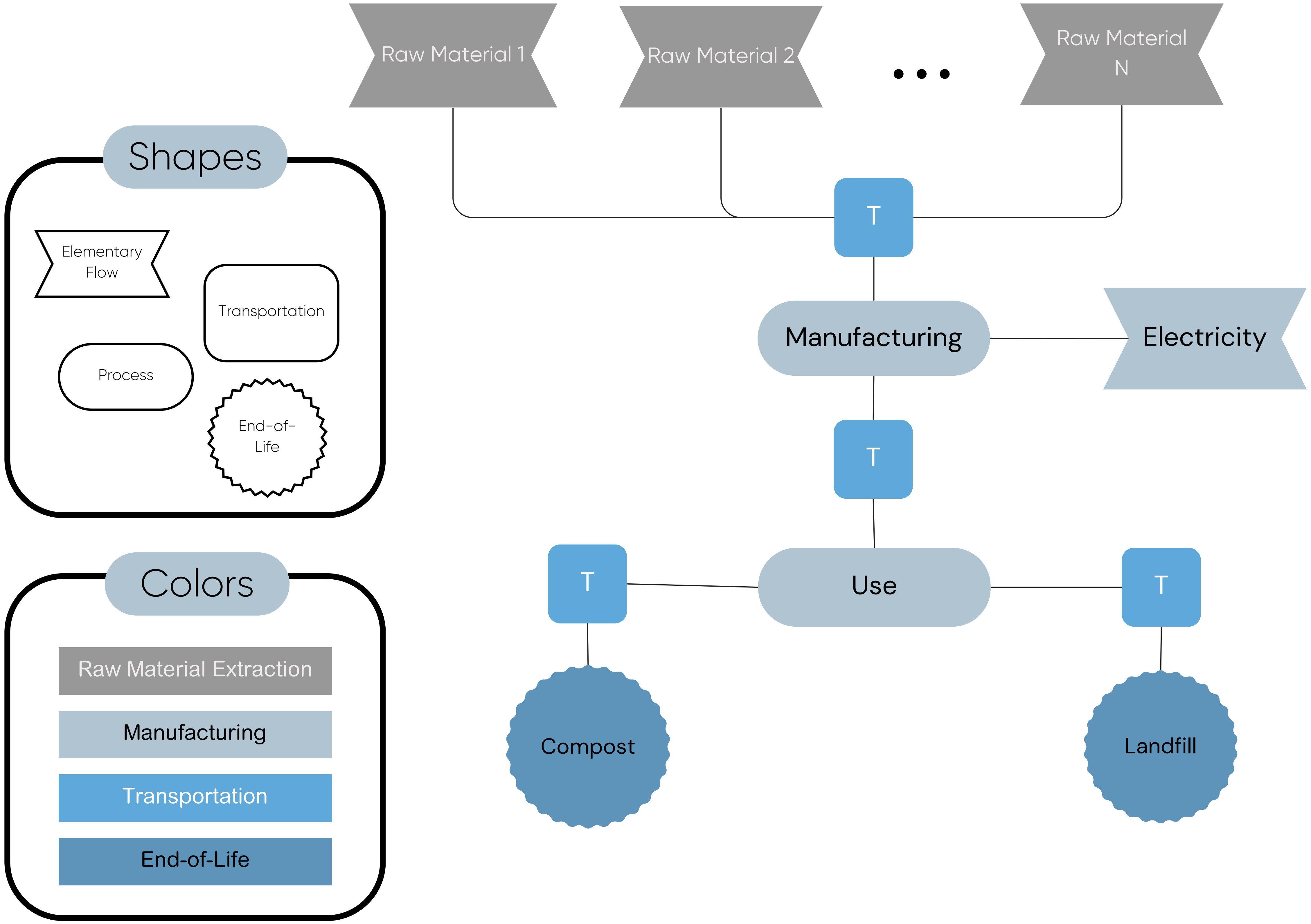
Cruz Foam LCA

WE CONDUCTED A PEER REVIEWED CRADLE-TO-GRAVE LIFE CYCLE ASSESSMENT TO EVALUATE THE ENVIRONMENTAL IMPACT OF STANDALONE CRUZ FOAM ACROSS NINE DIFFERENT ENVIRONMENTAL IMPACT INDICATORS.

A cradle-to-grave life cycle assessment includes the entire life cycle of Cruz Foam from the extraction and manufacturing of raw ingredients to disposal of the foam. Three disposal scenarios were evaluated ranging from best case to worst case:

- 100% disposal to compost
- 50% disposal to compost and 50% disposal to landfill
- 100% disposal to landfill

The figure to the right illustrates the process flow diagram of the evaluated life cycle.



GaBi LCA software was used to conduct the impact assessment. The top figure illustrates the results in a normalized bar graph.

Each impact category uses a different unit, therefore, they cannot be compared unless normalized. The top figure uses the 100% landfill disposal scenario as the normalizing factor to illustrate that an increased percentage of Cruz Foam going to compost mitigates impacts in all of the nine categories. Cruz Foam can best actualize its intended benefits when composted instead of landfilled. This is because landfills release methane, a greenhouse gas that is 25 times more potent than carbon dioxide - the greenhouse gas that is released in the composting process.

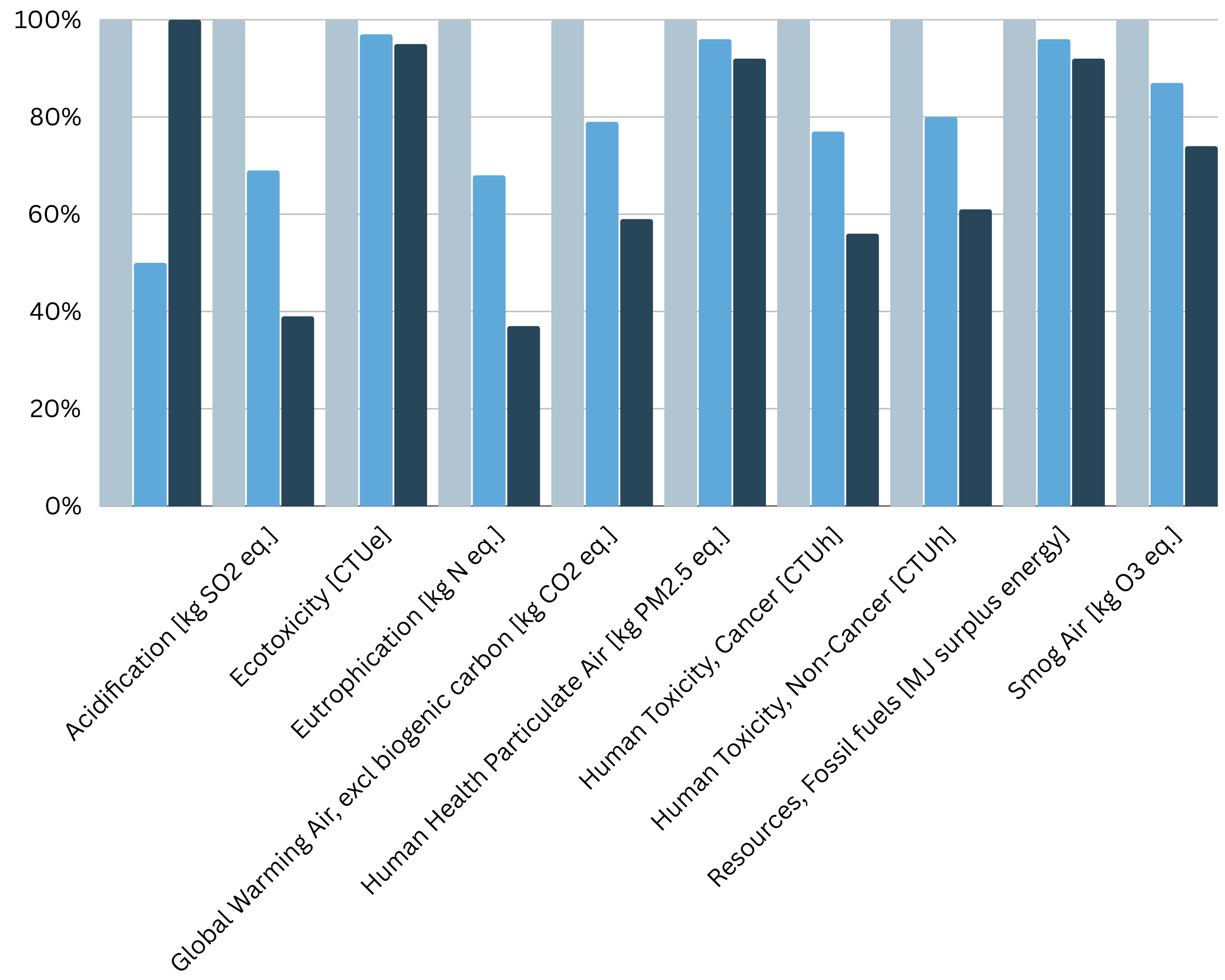
The majority of Cruz Foam impacts are attributed to upstream and downstream emissions. Upstream emissions - the emissions associated with extraction and manufacturing of raw materials - contribute at least 40% of impacts in eight of the nine impact categories.

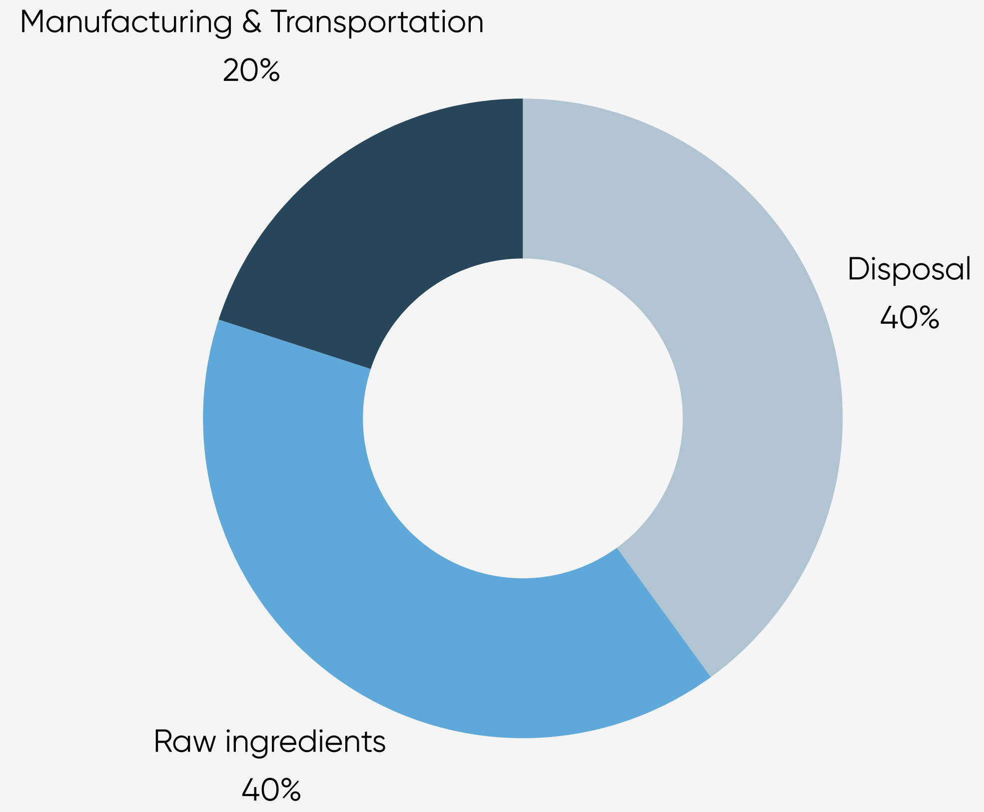
Downstream emissions - the emissions associated with disposal - contribute at least 40% of impacts in six of the nine impact categories.

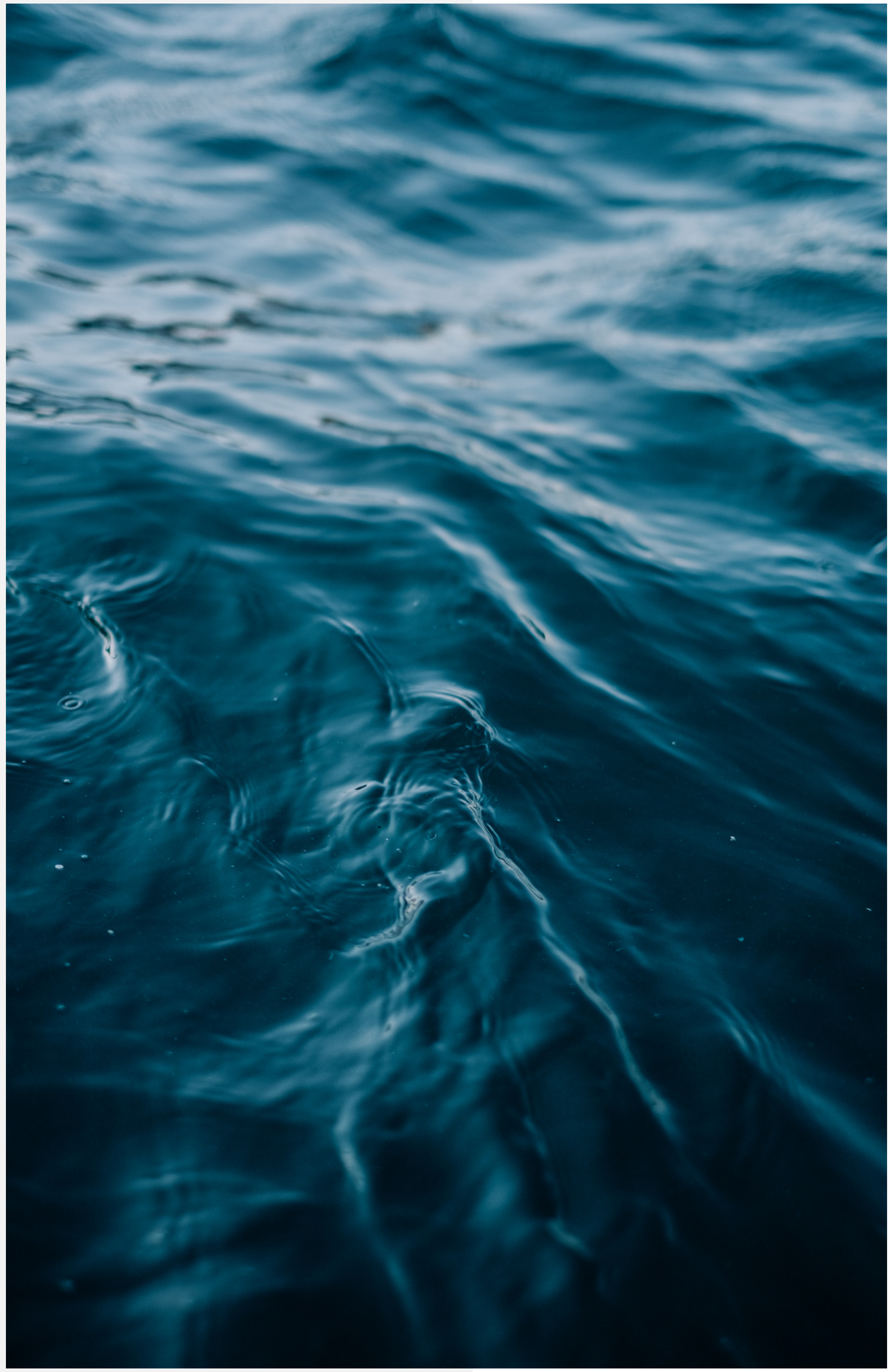
While both upstream and downstream emissions are largely outside of our direct control, these takeaways present an opportunity to address these environmental hotspots through the implementation of sustainable supply chain management and disposal methods. Furthermore, this LCA allows Cruz Foam to focus on areas of mitigation that will result in the largest positive change to our product life cycle.

No matter what we're measuring, Cruz Foam has the lowest environmental impact when disposed of in compost rather than landfill

As the production of Cruz Foam scales, it is essential to minimize its environmental impact. This LCA serves as a vital step to measure the product's potential impact, identify areas of concern, and work towards future mitigation.







SOURCING

At Cruz Foam we are highly intentional about where we source our ingredients. Just like we purchase healthy ingredients for our bodies, we believe our packaging deserves the same care.

At every step, we aim to utilize circular ingredients that have minimal manufacturing impacts and won't contribute to long-lasting pollution during disposal. For example, Cruz Foam is made from 70% upcycled food waste. By diverting this waste from landfills and using it to create our foam - which replaces yet another landfill bound product (conventional packaging foam) - Cruz Foam contributes to the circular economy.

Sourcing Practices

WHILE NOT PARTICULARLY TASTY, OUR INGREDIENTS LIST MAKES US THINK OF CRUZ FOAM AS CLOSER TO FOOD THAN TO CONVENTIONAL FOAM PACKAGING. WE ALSO TAKE SERIOUSLY THE EFFECTS OF INGREDIENT GROWING PRACTICES KNOWING THAT APPROXIMATELY 35% OF GREENHOUSE GAS EMISSIONS COME FROM THE FOOD SYSTEM. BELOW ARE THE SOURCING PRINCIPLES WE ADHERE TO:

1. **Transparency:** It is imperative that we have visibility into our supply chain. Understanding where our materials come from and how they are produced help us make more informed decisions about the sustainability of our products. This includes an annual supplier code of conduct questionnaire provided to all suppliers, site visits, and careful review of certifications and audits.

2. **Localization:** Sourcing materials locally reduces transportation emissions, supports local economies, and promotes transparency in the supply chain. Whenever possible, we prioritize suppliers who are located close to our production facilities.

3. **Environmental Impact:** We prioritize suppliers who use sustainable production methods such as using renewable energy, minimizing waste, using renewable or recyclable materials, and reducing water consumption.

4. **Ethical Labor Practices:** We are committed to working with partners who are paying workers fair wages, providing safe working conditions, and not using child labor.

5. **Continuous Improvement:** Just as we are constantly striving to improve our products, we put that same care into our supply chain. Sustainable sourcing is an ongoing process, and it's important to continuously assess and improve our sourcing practices. This involves enforcing a detailed supplier code of conduct, monitoring supplier performance through surveys and audits, and regularly reviewing and updating our sourcing policies and practices.

70% Upcycled Content

In line with our third sourcing principle, seventy percent of our ingredients are made from landfill bound food waste.

100% Reused Equipment

Cruz Foam is a drop-in technology designed to run on existing extruders, eliminating resource intensive equipment production

Recycling

The way Cruz Foam returns to the earth is just as important as the way it is produced. Our foam has been intentionally and meticulously engineered to avoid adverse effects on our environment in its disposal. We are constantly engaging in relevant research, testing, and certification for our formulas and products.

HOW TO DISPOSE

Recycling Cruz Foam

When it comes to disposal, the level of ease for the end consumer directly translates to higher landfill diversion rates. To this end, all Cruz Foam products adhered to a paper product are curbside recyclable. Rather than expecting end consumers to separate foam from paper, this disposal option allows them to throw the full packaging product in the recycling bin to be made into another paper product and further the life of the material.

At the materials recovery facility (MRF), the foam is washed out in the slurry leaving the usable fibers from the paper to be made into other paper products that can then be sold in secondary markets.

Testing on the first generation Cruz Foam showed that it is 98% repulpable under the Fibre Box Association voluntary standard for repulping and recycling corrugated fiberboard.

Case Study: First Generation Cruz Foam

A first generation Cruz Foam cooler, passed Part I and II Recyclability Testing under the Fibre Box Association voluntary standard for repulping and recycling corrugated fiberboard. This is a two part test signifying that our paper combined products can be used to create further usable paper products.

- Part I - Repulpability: This part asseses the ability of a product to be turned back into usable paper pulp. This test involves blending a paper product into pulp. The pulped material is separated in a screen with 0.010-inch or smaller slots to determine fiber recovery as a percentage of the amount of fiber charged. The Cruz Cool received a 98% fiber recovery rate.

- Part II - Recyclability: This part assesses the ability of the repulped product to create usable sheets of paper compared to a control material. To pass, the product must cause no adverse operational impacts on the machinery, and the resulting sheets must have no more than 15 "spots" caused by non-fiber treatments to the product. The Cruz Cool caused no adverse operational impacts and had 1 less spot than the control plain cardboard.

98%

Fiber recovery rate on Part I - Repulpability

1 less

Average "spot" compared to the control material on Part II - Recyclability

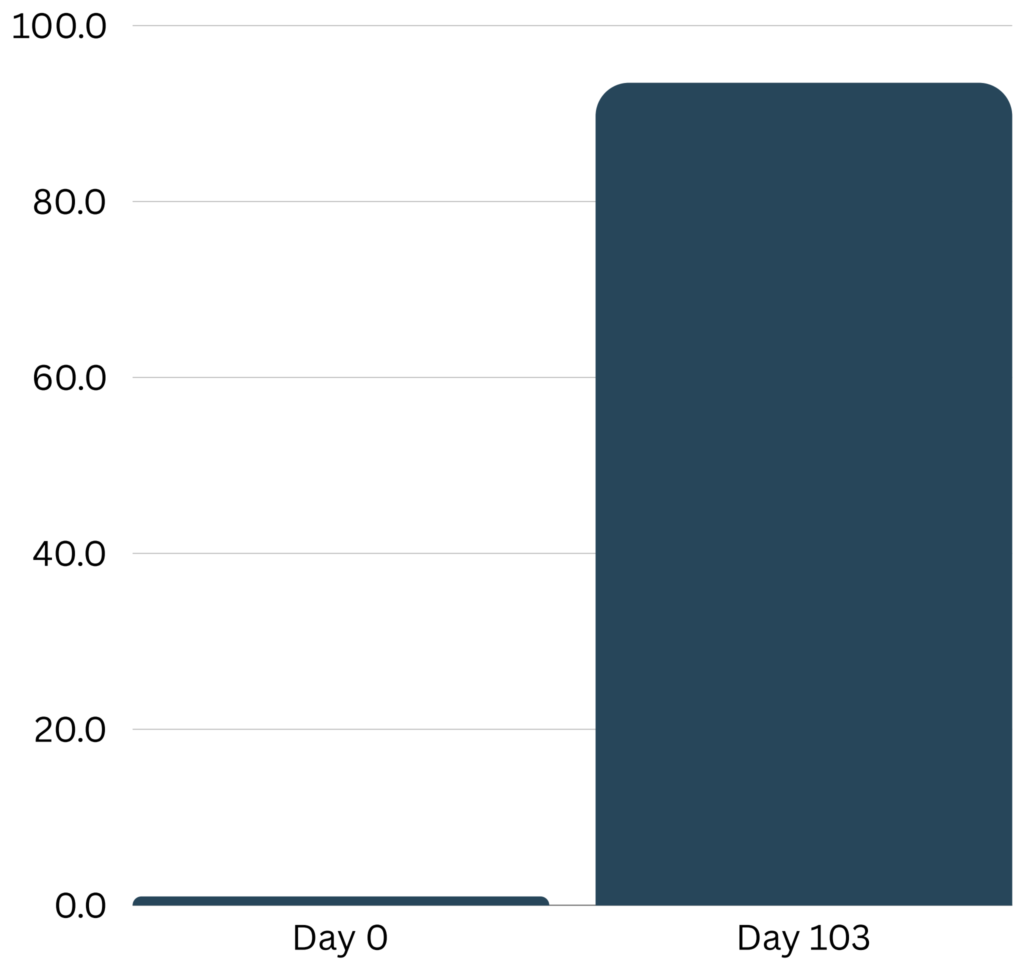
Composting

COMPOST

All standalone Cruz Foam products are ASTM tested industrially compostable, and show excellent results in home composting environments. Composting is the process of breaking down organic matter using bacteria resulting in nutrient-rich soil, which has market value. The creation of compost avoids methane emissions by diverting organic waste from the landfill, reducing the need for chemical fertilizers, increasing soil water retention thereby preventing erosion, and further providing carbon sequestration. At Cruz Foam we want to aid the production of compost which is why our foam has been designed to compost within a short timeline and provide vital nutrients to the soil.

ASTM Compostability Testing

Cruz Foam has passed ASTM D6400 and D5338 compostability testing at the Environmental Research and Innovation Center at the University of Wisconsin OshKosh. The ASTM D6400 and D5338 tests proved Cruz Foam biodegrades in approximately 100 days. The figure below shows the biodegradation percentage of Cruz Foam over a two month period compared to a control substance of microcrystalline cellulose and compost.



Cruz Foam passed both the biodegradability and disintegration portions of ASTM D6400 and D5338

ASTM D6400

This standard sets criteria for labeling plastic products as "compostable," ensuring they meet specific requirements for biodegradability, disintegration, and absence of toxic residues to break down in composting facilities.

ASTM D5338

Similar to D6400, this standard applies to plastic materials and shows the degree and rate of aerobic biodegradation in laboratory conditions, at thermophilic temperatures.

TEST RESULTS

Industrial Composting

Juneau Composts

In addition to positive lab testing results, the first generation foam has been successfully pilot tested in industrial composting settings. A visual test performed at Juneau Composts in June of 2022 in a covered windrow compost yielded full biodegradation in as little as two weeks. Mesh bags filled with first generations Cruz Foam were placed in a covered windrow pile and uncovered over time during the turning process. The first bag was found after two weeks with no Cruz Foam residuals and the second bag was found after two months with no Cruz Foam residuals and only a few leaves that worked their way into the mesh.

This was a visual test with variable timing based on the turning process. This means that the Cruz Foam samples could have reached full biodegradation anytime between insertion into the pile and when the samples were collected.

Napa Recycling & Waste Services

Another test was performed in a covered aerated static pile (CASP) compost at Napa Recycling and Waste Services in August of 2022. This test was based on the 2021 Streamlined Field Testing Protocol: Mesh Bag Method to Assess Disintegration of Certified Industrially Compostable Foodware and Packaging created by the Compostable Field Testing Program (CFTP). In this test, six bags of first generation Cruz Foam (along with a single sheet of kraft paper to be used as control) were placed in the CASP. After 60-75 days, there were no remnants of either the Cruz Foam or the control indicating that both materials successfully composted.

Day 0

Day 60

Lomi™ Waste to Dirt Testing

Cruz Foam is Lomi Approved.™ Cruz Foam was tested in the Lomi™ - a kitchen countertop appliance, food-scrap collector, and modular digester in June of 2022. When added to the appliance, first generation Cruz Foam received a score of 100/100. This is the first time this score has been awarded to a Lomi™ test participant. The Lomi™ transforms kitchen waste to dirt by accelerating the breakdown of waste which allows more surface area for microbes to speed up the process of composting. This creates a nutrient-rich dirt that can be used as a healthy soil amendment.

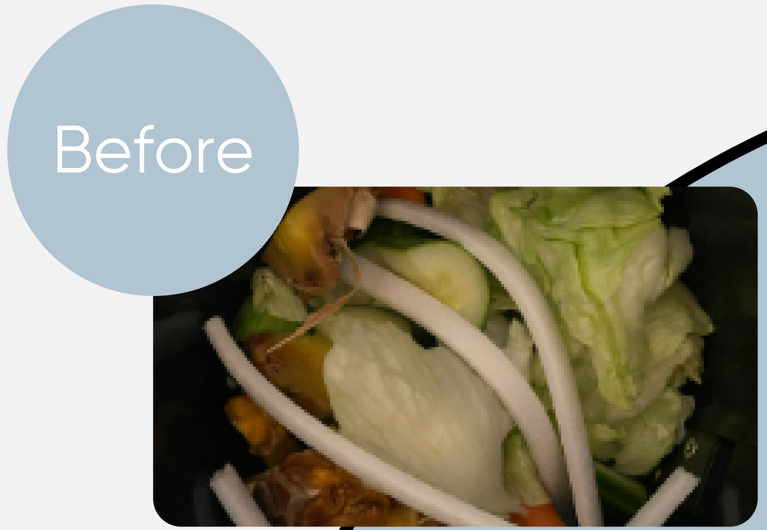
This test includes 2 phases. During phase 1 Cruz Foam was placed in the Lomi™ with food scraps and run on a 5-8 hour cycle. At this point, Cruz Foam had reached full disintegration. Cruz Foam was then run on a second Lomi approved cycle per testing protocol.

To receive a score of 100 Cruz Foam demonstrated the following criteria to the highest degree:

1. Reached full breakdown within one cycle of the Lomi.™
2. Met standard compost certification requirements - transformed into CO2 and organic matter in an aerobic composting environment.
3. Released nothing that was toxic, or would become toxic that is harmful for the environment or could hinder plant growth.
4. Physically disintegrated to a minimum threshold size after a Lomi™ cycle.

The Lomi™ is created to break down food waste in one cycle. A second cycle is needed for most compostable packaging. This test proves that the rate at which Cruz Foam breaks down in a composting environment is on par with food waste.

Second generation Cruz Foam is currently undergoing this test.



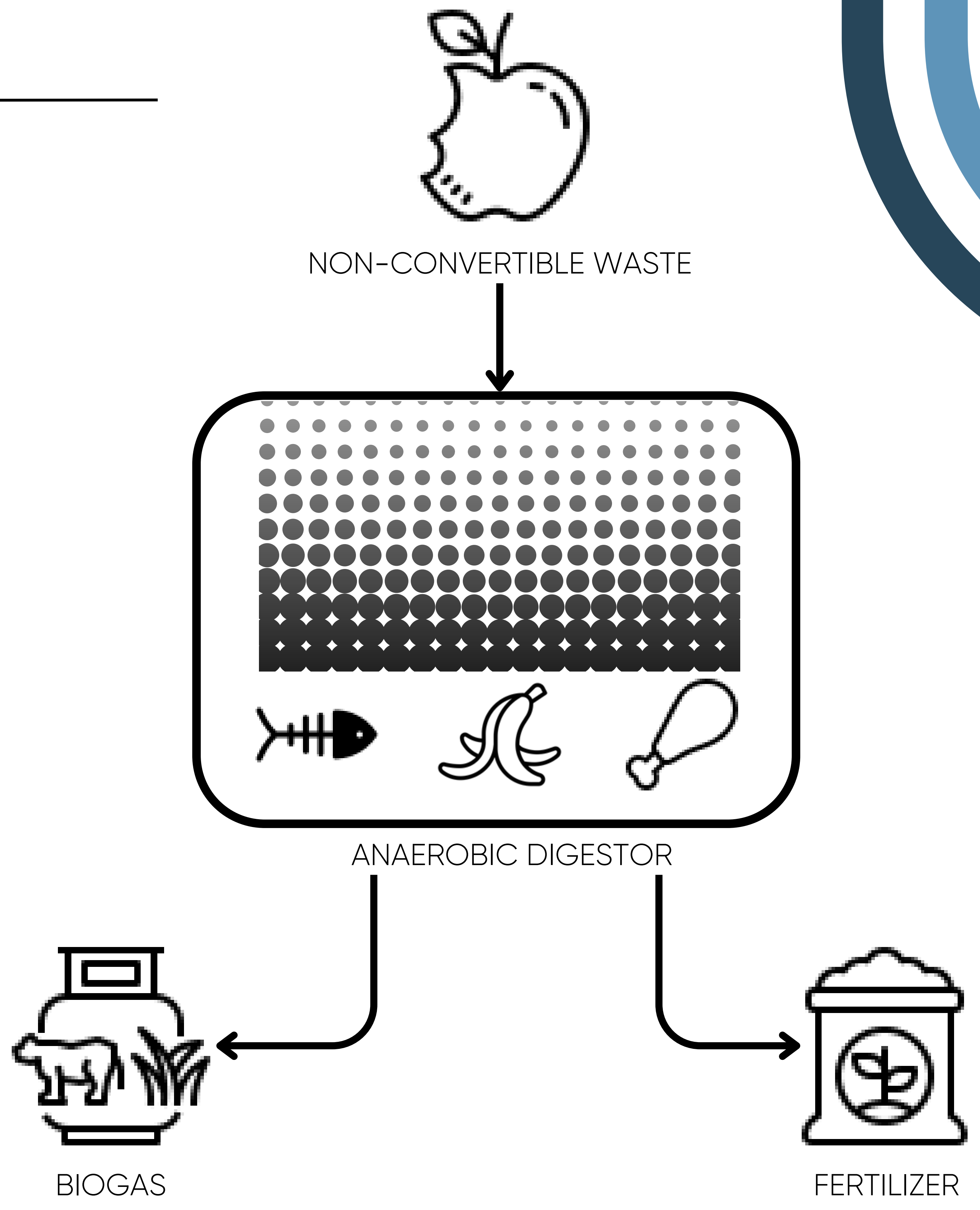
Anaerobic Digestion

Anaerobic Digestion

Our first generation Cruz Foam has also undergone a biomethane potential (BMP) test at the Oshkosh lab at the University of Wisconsin, which yielded 68.2% methane content indicating an excellent biogas quality rating.

In addition to lab scale testing, first generation Cruz Foam has also been successfully tested in a modular anaerobic digester on the Cruz Foam campus, with a Home BioGas system in 2022. Anaerobic digesters take organic materials such as animal manure, agricultural residues, and food waste, and turn them into outputs of biogas (primarily methane and carbon dioxide) that can be used as an energy source, and digestate, a nutrient-rich byproduct that can be used as fertilizer.

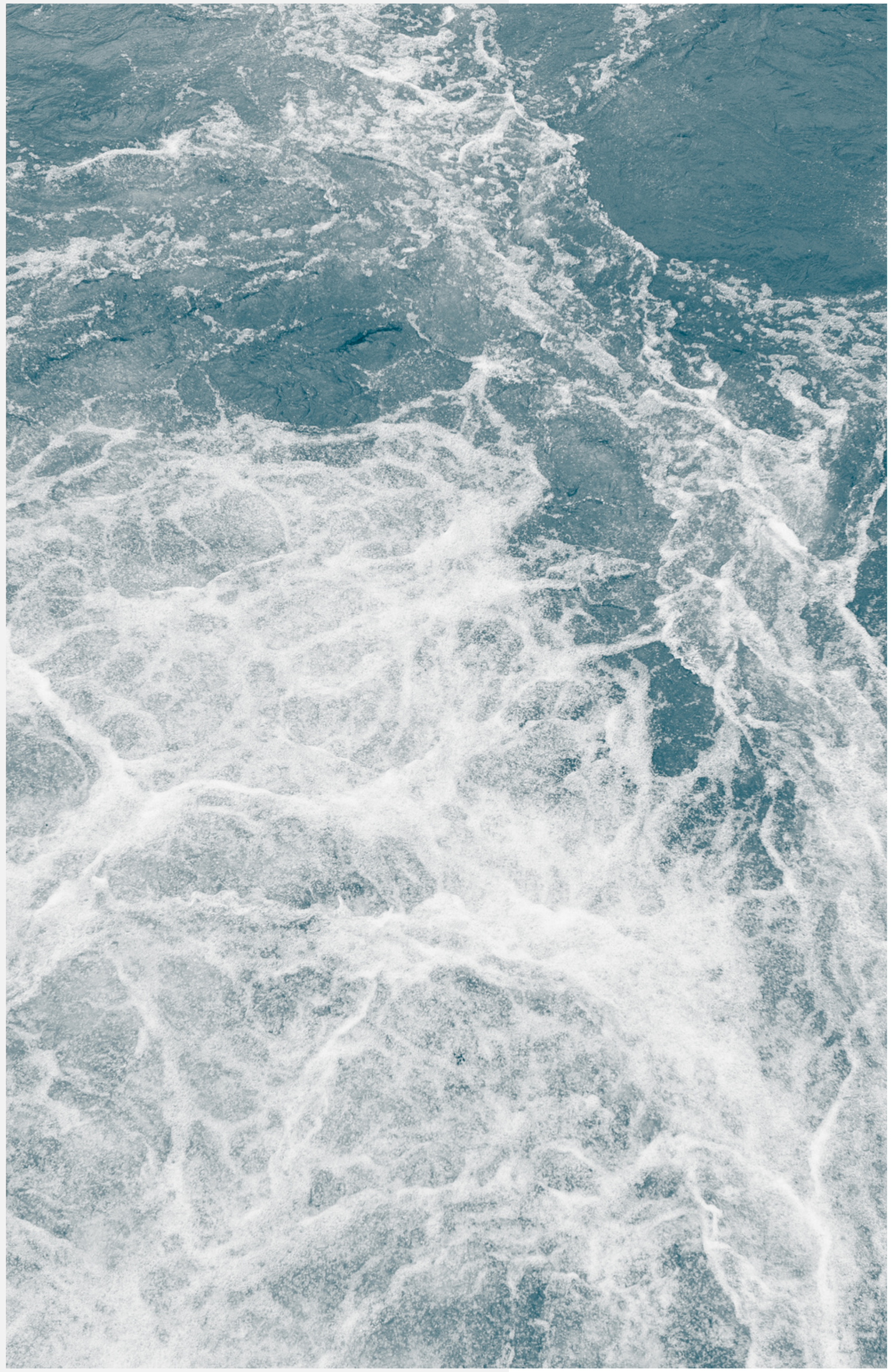
The addition of Cruz Foam to the activated digester continued to produce usable methane gas which has been used for cooking at the Cruz Foam campus.



68.2% Methane Content

Cruz Foam recieved an excellent biogas quality rating in a biomethane potential test

Solubility & Plant Growth



PLANT GROWTH

In the past, composting streams have often been disadvantaged by the inclusion of compostable packaging due to its long composting timeline compared to other organic waste materials like yard and food scraps. Frist generation Cruz Foam is unique in this respect because it is highly hydrophilic, meaning it will disintegrate with the addition of water. This aids in the composting process by allowing for a faster biodegradation timeline on par with other organic waste materials.

In February of 2023 Cruz Foam worked with Regenerative Waste Labs to conduct a 3 month study on our first generation foam exploring optimal water solubility conditions, effects on blackwater treatment systems, and ecotoxicity on plants and soil.

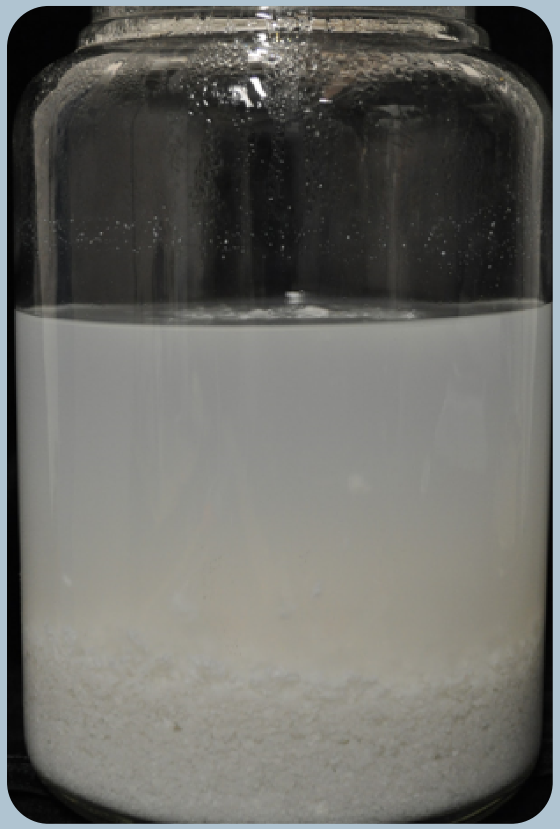
Water Solubility

The study found that the optimal conditions for dispersing first generation Cruz Foam in water is 60°C (140°F) with a concentration of 50g/L. The resulting slurry from Cruz Foam dispersal in water was tested against general acceptable levels of the following in wastewater treatment plants:

- **Biological oxygen demand (BOD):** the amount of oxygen required by microorganisms to decompose organic matter in wastewater.
- **Chemical oxygen demand (COD):** the oxygen needed to oxidize organic matter in wastewater.
- **Total suspended solids (TSS):** a measure of the amount of solid material that is suspended in wastewater. Generally, wastewater treatment systems use 7mm sieves to remove suspended solids. Wastewater with high levels of particulate matter can significantly impact these systems.
- **Alkalinity and acidity (pH):** extremes can cause disruptions to the microbial treatment process.
- **Fats, oils and greases (FOGs):** can cause blockages and backups in the system.
- **Macronutrients:** such as phosphorus, nitrogen, and sulphides can contribute to nutrient pollution in waterways.

The Cruz Foam slurry was found to be appropriate for disposal in blackwater sewer systems (systems used to treat wastewater from bathrooms and toilets).

Equivalent of one small package of bio-foam size reduced (1 x 4 x 4 cm).



Slurry obtained by dispersing the bio-foam in 60 °C potable water (3 L) after 10 minutes of stirring.

Plant Growth

This slurry was also used to conduct a plant growth and ecotoxicity test. This consisted of a 6 week plant grow test comparing 3 soil treatments on the growth of lettuce seed and onion seeds:

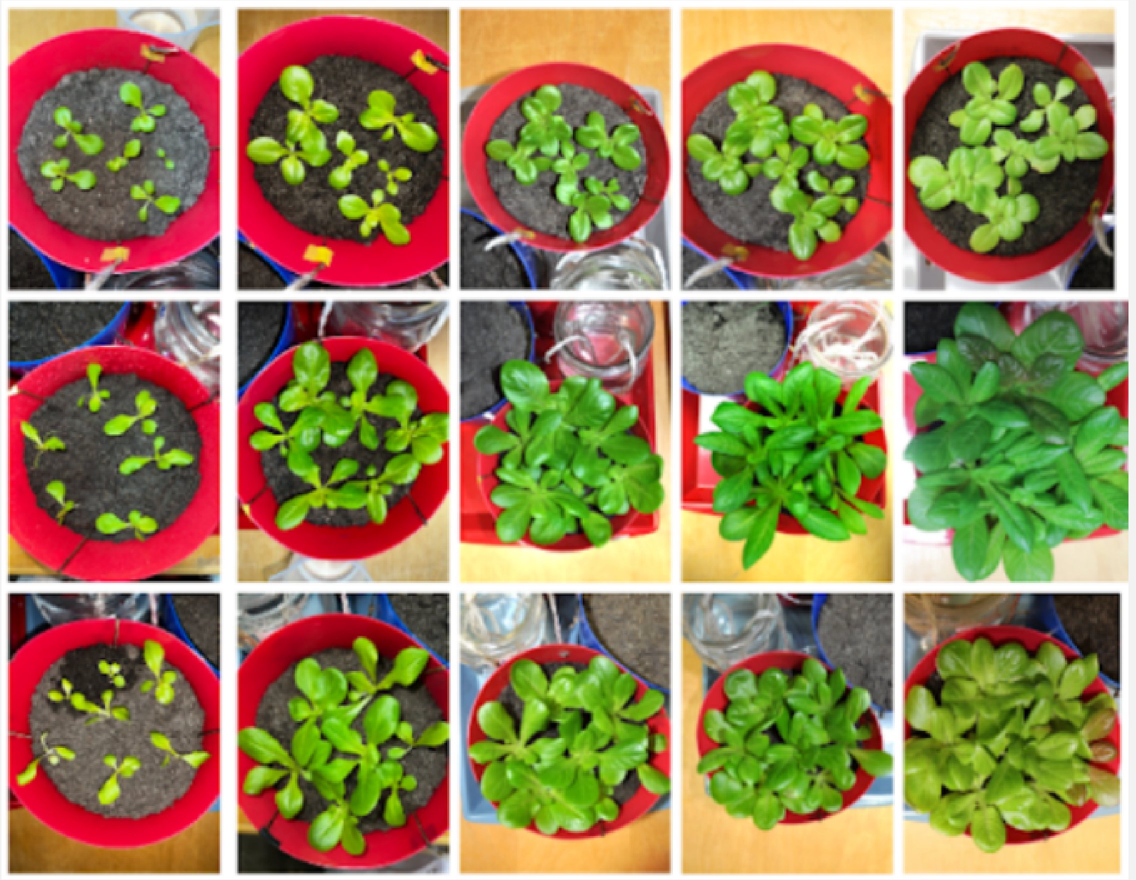
- Control Denbow turf soil without any amendment
- Treatment with organic fertilizer
- Treatment with Cruz Foam slurry

The top figure shows a visual representation of the results of the 6 week lettuce growth test.

The Cruz Foam slurry treatment resulted in the shortest seedling emergence time and a growth rate significantly better than the control, and rivaling the organic fertilizer treatment.

The bottom figure shows the proportion of emerged seedlings, and the median emergence time in days.

In the lettuce test the Cruz Foam slurry treatment performed the best with the highest percentage of emerged seedlings and the shortest median emergence time. In the onion test the Cruz Foam slurry had a slightly lower proportion of emerged seedlings but the shortest median emergence time.



	Lettuce		Onion	
Treatment	**Proportion of emerged seedlings**	**Median emergence time in days**	**Proportion of emerged seedlings**	**Median emergence time in days**
Control	85.7%	4.5	92.9%	7.7
Organic Fertilizer	89.3%	4.5	92.9%	8.2
Cruz Foam Slurry	96.4%	4.4	89.3%	7.5

Soil Health

In addition to the plant growth tests, the overall health of the soil treated with the Cruz Foam slurry was tested using principal component analysis that explored the following parameters in relation to ecotoxicity:

- pH
- Organic matter percentage
- Available phosphorus (P)
- Available potassium (K)
- Zinc index
- Manganese index
- Cation exchange capacity
- Potassium to magnesium ratio
- Total available nitrogen (N)
- Sum of N-nitrate and N-ammonium

Cruz Foam slurry was found to have no ecotoxicity risks when applied to soil. The plant growth tests clearly show that Cruz Foam has advantageous effects when applied to soil.

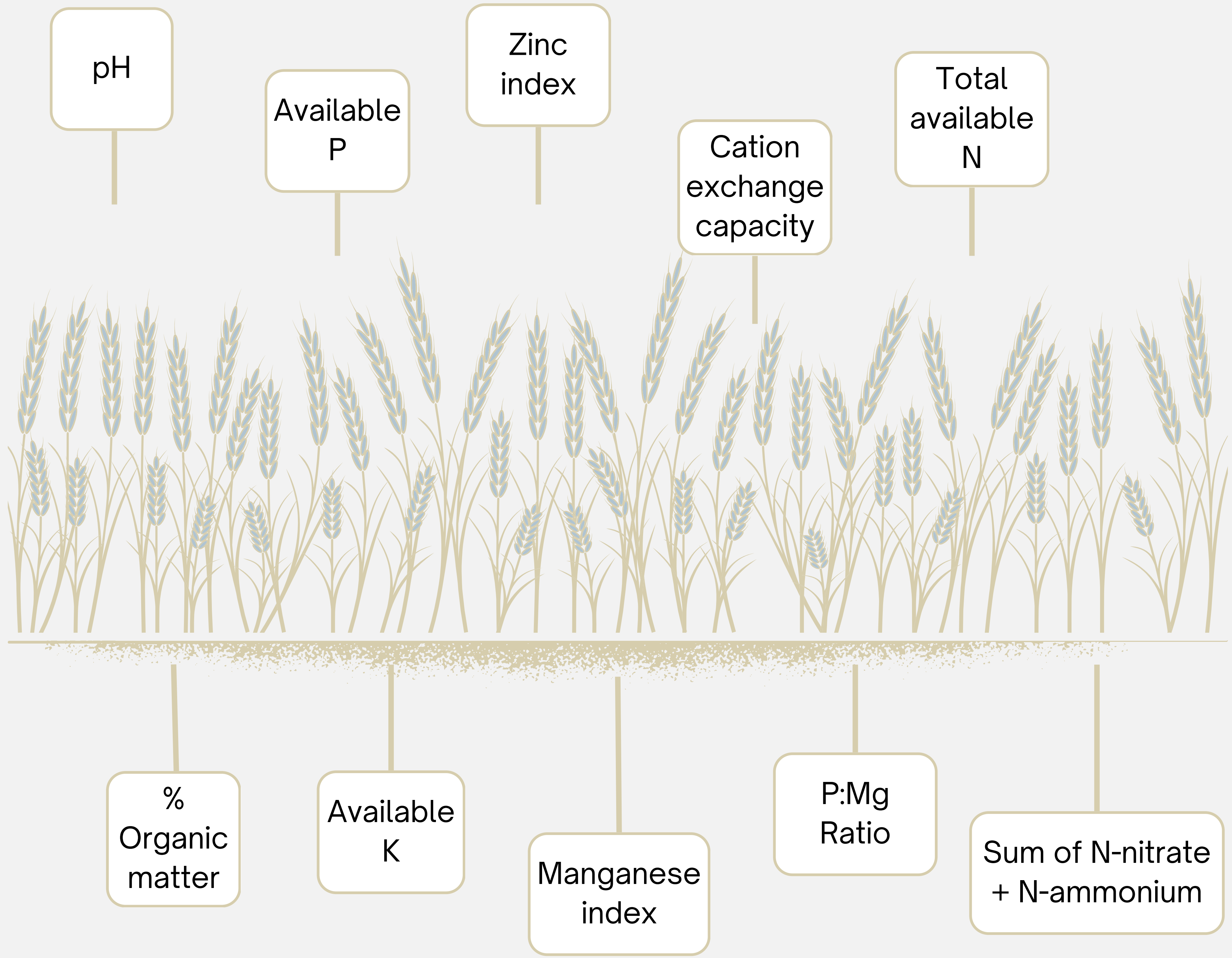
The bio-based nature of Cruz Foam makes it an excellent candidate for a soil amendment - even out performing organic fertilizer in some metrics.

Dispersing Cruz Foam in a water based slurry that is applied to plants is a fantastic end-of-life option.

Cruz Foam is currently being used as a vessel for a growing medium which is planted in soil for the agricultural industry. Cruz Foam was identified as an excellent candidate for this project given its high disintegration rate in the presence of moisture, bio-benign properties, and soil enriching ingredients.

Cruz Foam is being used alongside soil (the ideal end-market for composters) to enrich the growing capabilities of plants, which further illustrates the suitability of Cruz Foam in composting settings.

The true circularity of Cruz Foam is demonstrated by the qualities shown in these tests from ingredient farming to the healthy feedstock used to make soil that can again contribute to the food supply. These results are extremely encouraging data points, which we intend to build upon moving forward.



Plants have significant growth after 10 days in Cruz Foam grow media

What Does All of This Tell Us?

Conclusion

Cruz Foam is made by following nature and is dissolved by nature. We've created our natural foams to match or exceed conventional protective and insulative packaging foams on a technical performance level, and to beat them on an environmental level. Our products are continuously and rigorously tested in both lab and real world settings to ensure that we are using the most responsible practices from sourcing to disposal.

Each test we perform on our foam is meant to ensure that it disposes similarly to average food waste and its environmental footprint is considerably less than current benchmarks in the packaging industry. For example, our LCA allowed us to not only identify areas for further mitigation within our supply chain, but also proves Cruz Foam has a substantially lower footprint than many packaging items in the market today.

Current packaging benchmarks calculate the carbon footprints of anything from a single use plastic bottle to a reusable glass cup (with weights from 13-400 grams) to be anywhere from 2 times (reusable glass cup) to 27 times (single use glass bottle) the carbon footprint of 55 grams of Cruz Foam.

Calculating the environmental footprint of Cruz Foam through LCA is a vital part ofour sustainability program, but it is only one part of the story. It is imperative that we test our product in real world scenarios like composting, recycling, and anaerobic digestion to ensure that our products minimize impacts on the environment and contribute to the circular economy through use in secondary markets for soil, paper, and energy.

We strive everyday to exceed the environmental gold standard by creating a better product and a better world, and to help our customers meet their sustainability goals while supporting high performance and brand satisfaction requirements.

GLOSSARY

Anaerobic Digestion: A process in which microorganisms break down organic matter in the absence of oxygen to produce biogas, a mixture of methane and carbon dioxide, and a nutrient-rich digestate that can be used as fertilizer.

ASTM D6400: A standard specification for compostable products - equivalent to the European EN 13432 standard, which outlines the requirements for their biodegradation and disintegration under controlled composting conditions. Often performed with ASTM D6868.

ASTM D6868: A standard specification for biodegradable plastics, which outlines the criteria for their biodegradation and disintegration in a range of environments, including soil, water, and marine environments. Often performed with ASTM D6400

Biodegradable: Capable of being broken down into natural substances by microorganisms, such as bacteria or fungi, over an unspecified amount of time, temperature, and other conditions.

Compostable: Capable of being broken down into natural substances in a composting environment, typically within a specified time frame and under specific conditions.

Downstream Emissions: Emissions that occur during the use and disposal phases of a product's life cycle, including emissions from transportation, energy use, and waste management.

End-Of-Life: The stage in a product's life cycle when it is no longer usable or functional and must be disposed of or recycled.

EPS: Expanded polystyrene, a lightweight, rigid foam plastic commonly used in packaging and insulation.

Feedstock: Organic materials used to make compost, such as food and yard waste. Raw materials that microorganisms use to break down and decompose the organic matter into a nutrient-rich soil amendment.

Grow Medium: A material used to support the growth of plants in hydroponic or soilless cultivation systems.

Hydrophilic: Able to absorb or dissolve in water.

Impact Category: A category used in life cycle assessment (LCA) to assess the potential environmental impacts of a product or process, such as climate change, resource depletion, or toxicity.

LCA: Life cycle assessment, a method used to evaluate the environmental impacts of a product or process throughout its entire life cycle, from raw material extraction to end-of-life disposal.

Methanogenesis: A process in which microorganisms break down organic matter in the absence of oxygen and produce methane gas as a byproduct. This process occurs in environments such as landfills and the digestive systems of animals, and contributes to the overall levels of methane in the atmosphere, one of the most potent greenhouse gasses contributing to global climate change.

MSW: Municipal solid waste, the waste generated by households, businesses, and institutions in a community.

Process Flow Diagram: A diagram that shows the sequence of steps involved in a process, including inputs, outputs, and the flow of materials and energy.

Recyclable: Capable of being recovered and reused in the production of new materials or products.

Upstream Emissions: Emissions that occur during the production and transportation of raw materials and energy used in a product's life cycle.

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