CEDARLANE
COLD CHAIN SOLUTIONS

# THERMO CHILL®
# *BIODEGRADABLE*
# FOAM

## SUSTAINABLE INNOVATION FOR PROTECTIVE PACKAGING

When polymers go through the recycling process, they experience additional heat histories. Each heat history causes deterioration in performance due to a loss in molecular weight. Unlike oxo-degradable technology, the material used in these containers does not accelerate the loss of molecular weight during recycling. Instead of using an oxo-degradation process, the Thermo Chill® Biodegradable Foam material employs an enzymatic biodegradation process, which does not impact recyclability. This material maintains the exceptional performance characteristics of molded EPS foam: high strength, light weight, superior insulation, and stable shelf life.

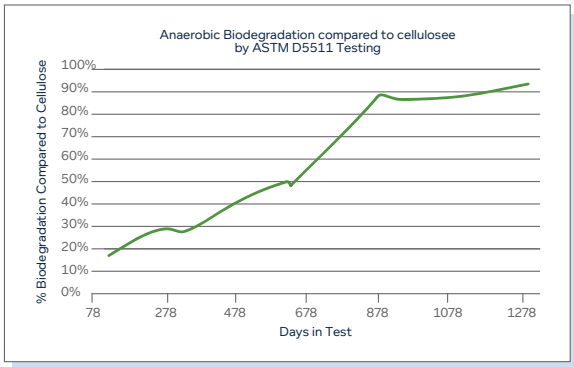
It requires no special packaging, does not change the resin properties, and does not biodegrade without a microbe-rich environment. The material leaves the same byproducts as organic material decomposition, including carbon dioxide ($CO_2$), methane ($CH_4$), and other renewable organic materials. Many landfills capture methane and burn it for fuel.

## THERMO CHILL® BIODEGRADABLE FOAM:

- Does NOT Affect shelf life
- Does NOT Create microplastics
- Does NOT Require UV protective packaging
- Does NOT Change the base resin properties

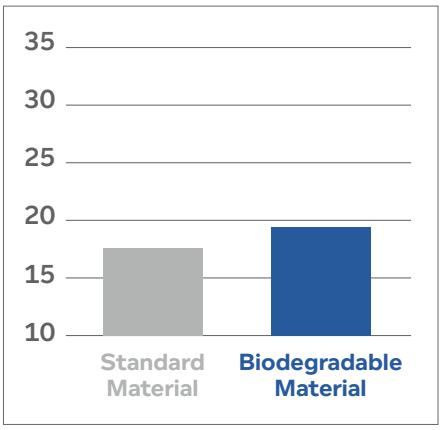
**While all EPS is landfill biodegradable, this material helps attract more living organisms to speed up the process and can be digested in a way that does not produce microplastics**

The containers are made from landfill-biodegradable material, which breaks down anaerobically by an average of 92% over 4 years. **They do not biodegrade without a microbe-rich environment.**

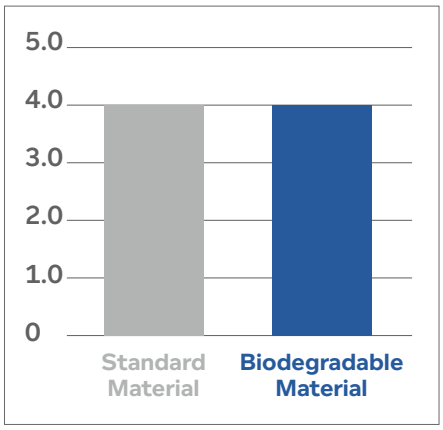


# COMPARATIVE TEST RESULTS

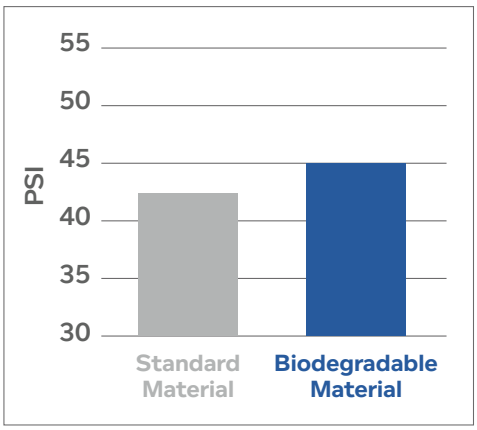
### COMPRESSIVE STRENGTH



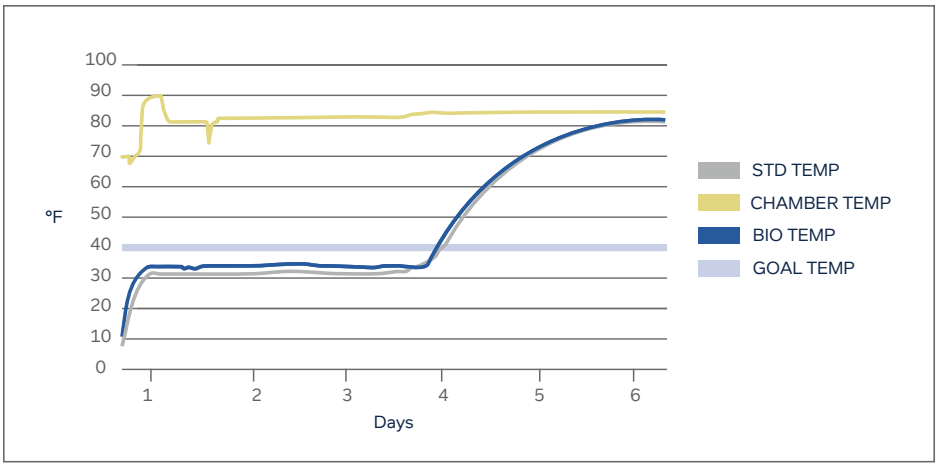

### R-VALUE PER 1"




### FLEXURAL STRENGTH




# BIO VS. STANDARD MATERIAL
# THERMAL TESTING (REFRIGERATED) – 227C & RB 30




After conducting a comparative test between the standard PT227C and the new biodegradable 227C, Polar Tech Industries is pleased to report no loss in performance between the two materials. This ensures a smooth transition to biodegradable materials with peace of mind!

The test involved conditioning six 8 oz water bottles to -10°F and packaging them inside each 227C container with three PTRB 30 cold packs, preconditioned to -20°F. The packages were then placed in a temperature-controlled chamber for 6 days while the internal temperature was monitored.

FIND OUR **COLD CHAIN CATALOGUE** *HERE:*

*www.cedarlanecoldchainsolutions.ca*

# FAQ

## WHAT'S DIFFERENT ABOUT THIS MATERIAL?

Biodegradable containers use proprietary biodegradable expandable polystyrene (EPS). This advanced material looks and performs like standard EPS, has the same shelf life, and remains recyclable with other polystyrene. This technology transforms a standard molded product into one with a new end-of-life story.

## IS THIS MATERIAL BIO-BASED?

No, EPS products are typically 0% bio-based, as they are made from polystyrene, a petroleum derivative.

## WHAT TEST WAS USED TO DETERMINE BIODEGRADABILITY AND WHAT WERE THE RESULTS?

The material was tested using ASTM D5511, which simulates conditions in wetter and biologically active landfills. It showed a biodegradation rate of 92% over four years. Note that the rate and extent of degradation may vary depending on landfill conditions, and the product's degradation may not continue indefinitely.

## DOES THE RATE OF BIODEGRADATION CHANGE IN DIFFERENT ENVIRONMENTAL CONDITIONS?

Yes, like organic materials, the rate of biodegradation for this material can vary based on environmental conditions.

## ARE THERE OTHER BENEFITS OF USING A BIODEGRADABLE FOAM?

This material is engineered for anaerobic biodegradation, meaning it breaks down without air and produces methane. Unlike oxo-biodegradation, it does not become brittle, requires no special packaging, and does not need shelf-life adjustments. It biodegrades only in a microbe-rich environment.

Note: Biodegradation occurs in landfills, reducing the volume of material in a landfill cell and freeing up space.

## WHAT IS LEFT BEHIND AFTER THE MATERIAL BIODEGRADES?

After biodegradation, the material leaves behind byproducts similar to those of organic material decomposition: carbon dioxide ($CO_2$), methane ($CH_4$), and other renewable organic materials. The landfill gas is captured and burned for fuel, leaving no microplastic contamination.

## ARE THERE OTHER TYPES OF BIODEGRADATION?

The material is designed for anaerobic biodegradation, which occurs without air and produces methane. Aerobic biodegradation happens with air and produces $CO_2$. Composting is a type of biodegradation that contributes to soil fertilization. Most landfills are designed to handle both aerobic and anaerobic biodegradation.

## WHERE CAN I RECYCLE YOUR CONTAINERS?

Check with your local recycling drop-off site to confirm if they accept EPS and in what form. Most sites accept EPS packing material, and there are over 500 EPS recycling programs across North America. We strongly encourage recycling EPS whenever possible to support a circular lifecycle.

## WILL THE CURRENT CONTAINER SIZE I USE HAVE A BIODEGRADABLE OPTION?

Yes! The same molds used for stock sizes can be used with either standard or biodegradable material.

CUSTOMER SUPPORT

CONTACT US TODAY
FOR MORE INFORMATION
OR TO REQUEST A SAMPLE!

sales@cedarlanecoldchainsolutions.ca

# DEFINITIONS

• **Bio-Based Material:** A material intentionally made from substances derived from living (or once-living) organisms.

• **Non-Oxo Biodegradation:** The process of breaking down organic materials, such as polymers, through enzymatic or microbial action without the use of oxo-degradable additives. This method relies on natural biological processes to decompose materials into simpler, environmentally benign substances.

• **Oxo Biodegradation:** The process where polymers or plastics are designed to degrade through a combination of oxidation and subsequent biodegradation, facilitated by additives known as pro-oxidants. These additives accelerate the fragmentation of the material into smaller molecules, allowing for microbial or enzymatic action to further break down the fragments into simpler compounds that can be assimilated by microorganisms in the environment.

• **Landfill Biodegradable:** Materials capable of decomposing or breaking down into simpler compounds under anaerobic conditions typical of landfill environments. These materials undergo microbial degradation in the absence of oxygen, leading to the conversion of complex organic substances into smaller molecules, gases, and residues over time. This process reduces landfill waste volume and minimizes the environmental impact of disposal.

• **ASTM D5511:** The American Society for Testing and Materials ASTM D5511 test represents the biodegradation potential of materials in biologically active landfills. It determines the rate of anaerobic biodegradation of plastic materials under high solids anaerobic conditions in landfills.

## OUR SPECIALTIES INCLUDE:

PRE-QUALIFIED SHIPPERS

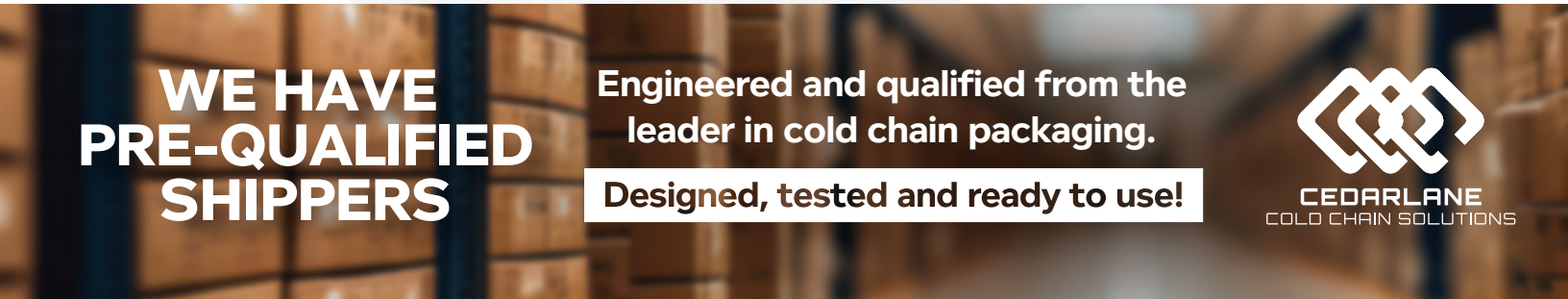
TEMPERATURE INDICATORS

INSULATED CONTAINERS

GEL PACKS & REFRIGERANTS

REUSABLE SOLUTIONS

## CONTACT US NOW:

**www.cedarlanecoldchainsolutions.ca**
**sales@cedarlanecoldchainsolutions.ca**
Phone: (289) 288-0014
Toll-Free: 1-866-423-7447
Fax: (289) 288-0004

*Version: 10.2024*