

*Plastics make it possible...
ENSO makes it responsible.*



ENSO RENEW RTP

RENEWABLE THERMOPLASTIC POLYMER





ENSO RENEW RTP™

A RENEWABLE, BIODEGRADABLE, COMPOSTABLE AND ECONOMICAL THERMOPLASTIC MATERIAL

ENSO RENEW RTP is a renewable thermoplastic used as polymer replacements and/or fillers developed with performance, biodegradability and economic value in mind. **RENEW RTP is not made from petroleum** based materials, but instead is created from agricultural products such as potatoes, cassava and corn.

ENSO RENEW RTP can replace petroleum based polymers in many applications and has the versatility to also be combined with standard plastics when strict performance parameters are required. ENSO RENEW is rapidly biodegradable in compost, marine and other waste environments and offers a simple and effective solution to an enormous environmental challenge. In fact, film made with ENSO RENEW has shown to biodegrade in 10 days within composting environments!

Available in both unblended pellets (100% RENEW RTP) and pre-blended pellets (blended with standard polymers to your specification), RENEW is a unique environmental solution viable for companies of all sizes.

ENSO RENEW supports your sustainability initiatives without compromising your product's quality. Brand owners will benefit from increased brand loyalty, and leverage a steadily growing market for green products.

“ENSO RENEW RTP can replace up to 100% of your products petroleum based plastic, with a natural, biodegradable, healthy and economical alternative.”



What Is Sustainability?

Sustainability is more than simply “going green” and it is no longer sufficient to run status quo. Today's market is dynamic, educated and the expectations of your customers are high. Providing sustainable solutions demands experts that understand the performance, design and disposal of your product to encompass the “3 R's” - REDUCE, REDUCE, REDUCE.

Reduce Carbon: Our goal is to reduce your environmental and carbon footprint. The use of renewable crop feedstock allows for sustainable development of polymer materials, reduction in carbon emissions and an overall improved environmental profile. When compared to polyethylene, production of RTP pellets consume up to **75% less energy and greenhouse emissions are up to 80% lower!**

Reduce Materials: ENSO solutions allow you to reduce the amount of petroleum based material used in your applications, compared to alternative green solutions. Our biodegradable and renewable solutions are used in very thin films and light-weighted packaging without loss in performance and properties, many manufacturers find increased performance and the ability to further lightweight materials when using ENSO solutions.

Reduce Waste: There are two primary forms of waste; scrap during manufacturing and product waste after use. ENSO has eliminated the historical high scrap rate due to processing difficulties and material incompatibility with alternative plastics. With ENSO you received fine tuned solutions that easily integrate in your machines and processes. And, whether your product is disposed of in a landfill, marine or compost environment, ENSO has the solutions for your application and prevent long term waste problems.

ENSO Plastics is the expert in plastic sustainability, providing the knowledge and experience to evaluate your materials and create tailored solutions ideal for your product performance needs and sustainability goals.

“a carbon footprint that is up to 80% lower than standard PE and requires 75% less energy to produce!”



Reduce Your Footprint - Replace Petroleum Plastics

ENSO RENEW RTP is a versatile polymer that can replace up to 100% of traditional petroleum based polymers. Depending on your product application, there are two methods of using ENSO RENEW RTP:

- **Use at 100%:** ENSO RENEW can be used at 100% for specific applications utilizing shorter shelf life requirements and where humidity and liquid contact is not of concern. RENEW RTP is an ideal environmental value when used as a stand alone polymer.
 - ✓ **Rapidly biodegradable in home compost**
 - ✓ **Marine degradable**
 - ✓ **Commercially compostable (ASTM D6400)**
 - ✓ **Safe for wildlife consumption**
 - ✓ **Complies with California Law for labeling as “Compostable”**
 - ✓ **Up to 80% reduction in CO2 emissions**

- **Blend up to 70% with your current polymer:** For more stringent applications requiring specific performance, ENSO RENEW RTP is an ideal solution to replace a portion of your current petroleum based plastic.
 - ✓ **Replace up to 40% of your petroleum plastic without affecting performance**
 - ✓ **Reduce CO2 emissions of raw material**
 - ✓ **Ideal for blending with LDPE**
 - ✓ **Good blend-ability with PE and PP**
 - ✓ **Gain highly sought after renewable claims**

Economical Solution

At ENSO, we understand that sustainability involves many aspects from materials to energy and from human impact to finances. To be sustainable a product must allow for economic sustainability as well. Whether you choose to use ENSO RENEW RTP as a complete polymer replacement, or are looking to offset a portion of your petroleum usage, ENSO RENEW RTP offers a solid solution at a price that understands your bottom line.

ENSO RENEW RTP is provided at volume scaled pricing to accommodate your company's needs.



Accelerate Your Responsibility

Call us today and see how quick and easy it is to have your plastic product provide an environmental solution.

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Renewable Non-Petroleum Based

Today's market demands alternatives to fossil fuel dependent materials that plague our environment. Many governments and corporations worldwide are pursuing and providing advantages to products that utilize renewable materials instead of fossil fuel based ones. ENSO RENEW RTP is a low-moisture-content thermoplastic resin made from all natural, renewable materials that allow you to reduce or even eliminate your use of fossil fuel based plastics.

ENSO RENEW RTP can be used in a variety of applications worldwide – from bags and films to packaging and service-ware. ENSO RENEW RTP allows companies to take advantage of bio-preferred programs initiated by governments and corporations while remaining cost competitive. So, whether you use it as a stand alone polymer (100% renewable), or blend it with your current polymer (up to 70% renewable), ENSO RENEW is a natural material you can trust to provide the environmental alternative you have been searching for.

“Practically every environmental problem we have can be traced to our addiction to fossil fuels...”

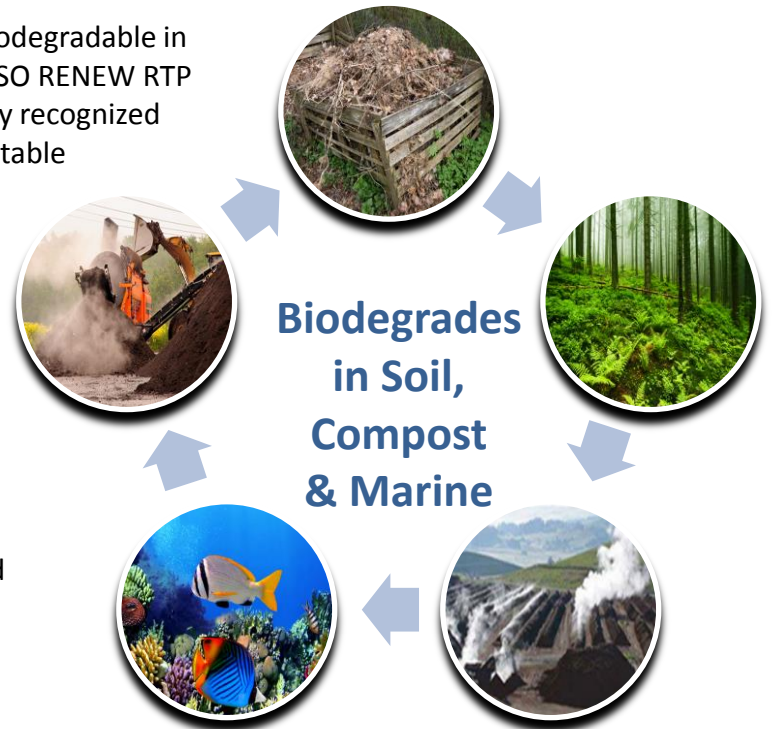
Dennis Weaver



Rapidly Biodegradable

ENSO RENEW RTP is naturally and rapidly biodegradable in soil, compost and marine environments. ENSO RENEW RTP easily passes the rigorous and internationally recognized ASTM D6400 standard for industrial compostable plastics – biodegrading in less than 10 days! These tests also validate that ENSO RENEW RTP leaves behind only healthful soil and biogases, just like an apple core or banana peel.

Whether your product is destined for a simple backyard compost, a commercial composting facility or the city landfill, ENSO RENEW RTP passes the most stringent requirements for biodegradability and sound environmental consideration, creating a product you and your customers will trust.



A HEALTHY AND NATURAL SOLUTION

ENSO RENEW RTP is a natural product made of starch and glycerin - so natural in fact that it is safe for wildlife, food packaging and the environment.



Organically Recyclable

For millions of years the earth has utilized a highly successful recycling program. All organic waste enters this recycling process called ORGANIC RECYCLING. Similar to your community recycling programs, ORGANIC RECYCLING involves taking carbon based waste (like plants), breaking it down into base materials (biogases and soil) and then allowing those materials to be used by currently living organisms to create new products and materials.

Many communities facilitate ORGANIC RECYCLING through industrial compost facilities. Some homeowners use ORGANIC RECYCLING in their own backyard without even realizing it through gardening and backyard composting! This is the ultimate recycling program and ENSO RENEW RTP fits right in where nature intended, a perfect option for recycling the natural way.



Physical Properties You Need

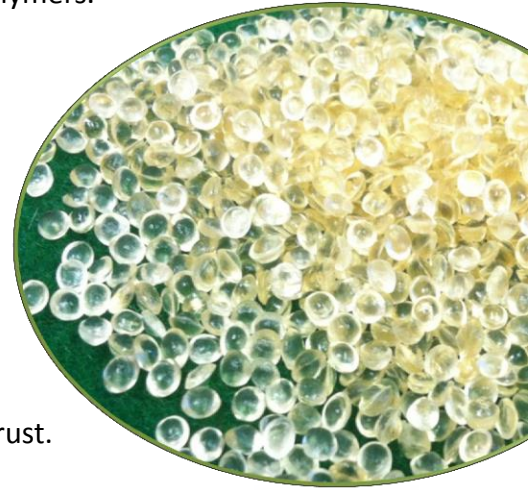
Oxygen Barrier: Products made with ENSO RENEW RTP exhibit excellent oxygen gas barrier to protect your products.

Low Moisture: ENSO RENEW RTP pellets boast moisture levels of less than 1% to improve process-ability on standard equipment and blend-ability with other polymers.

Extrudable: ENSO RENEW RTP can be used to make a completely renewable film, or if you prefer, you may blend RENEW RTP with your resin to create a finished film with a percentage of renewable material to offset your petroleum usage.

Injectable: Products made by injection molding are ideal for ENSO RENEW RTP and provide a strong solution for creating sustainable packaging.

Natural: ENSO RENEW RTP is a healthy, natural plastic that you can trust.



Technical Details

ENSO RENEW RTP is most often blended with other polymers, but can be used as a stand-alone polymer as well. The below properties refer to RENEW RTP in an unblended state.

ENSO RENEW RTP™	
Moisture Content	Less than 1%
Glass Transition	80-100 °C
Biodegradability	Highly biodegradable in marine, compost and soil
Ingredients	Natural Starch, Glycerin
Density	1.42 g/cm ³
Melt Flow Index	2.1 g/10 min
Melting Temperature	165-180 °C
Tensile Strength	>24 MPa
Impact Resistance	1.6 kg



Solutions Demanded by Consumers

Today's consumers are savvy, and they're interested in making a difference. Studies show that 85% of consumers buy green products, and of these shoppers, 84% consider the product's packaging before purchasing.



84% consider the product's packaging before purchasing.

Green products occupy significant retail space, and the trend is only going to grow. Increasing political pressures, more green incentives, diversified alternative energy resources, and a growing sense of urgency is driving consumers to make eco-friendly choices.

“ENSO’s leading edge technologies offer competitive advantages for companies manufacturing plastic products for virtually any application.”

The eco-friendly market is growing by leaps and bounds, resulting in higher instances of green-washing. Companies that can substantiate their green claims have a leg up in an increasingly competitive market, and can set their brand apart from the rest.

Eco-conscious consumers are notoriously loyal to products they believe in, and support those they can trust. ENSO's commitment to transparency and rigorous verification ensures that our products always deliver what we promise.



Trusted Environmental Solutions

ENSO Plastics was created with a vision of making the world a cleaner place through plastic solutions that are better for the environment. Our goal is to end plastic pollution by developing earth friendly plastic solutions.

We believe that a true environmental approach requires working together to find solutions that lead us to achieving the right environmental long-term goals. Our products provide biodegradable, compostable, renewable and sustainable plastics to achieve the goals of the most astute environmental considerations. These products not only address plastic pollution but will also assist in reducing our dependency on unsustainable resources such as petroleum.



ENSO™

“ENSO Plastics: The most influential global leader for innovative environmental plastic solutions, renowned as a highly ethical and profitable organization.”





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