POLYMER FUSION LABEL TECHNOLOGY

THE SOLUTION FOR REUSABLE PACKAGING

Labeling 101: The Basics

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POLYMER FUSION LABELING 101: THE CHALLENGES

The Challenge of Labeling Reusable Packaging from Polyolefin Thermoplastics

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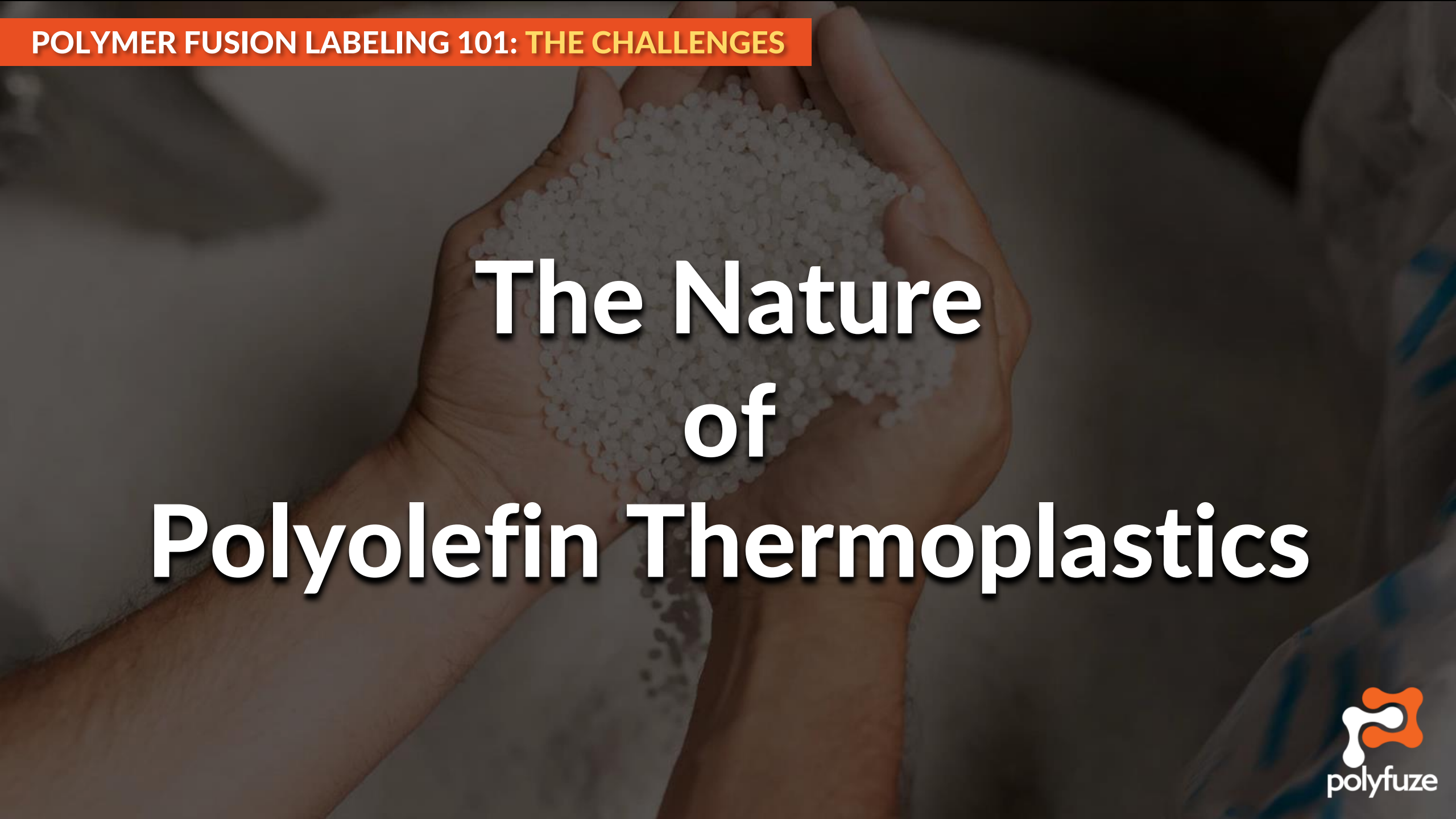

The Nature of Polyolefin Thermoplastics

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They are Low Surface Energy (LSE)

like Teflon™

(Adhesion-based labels resist the non-polar surface)

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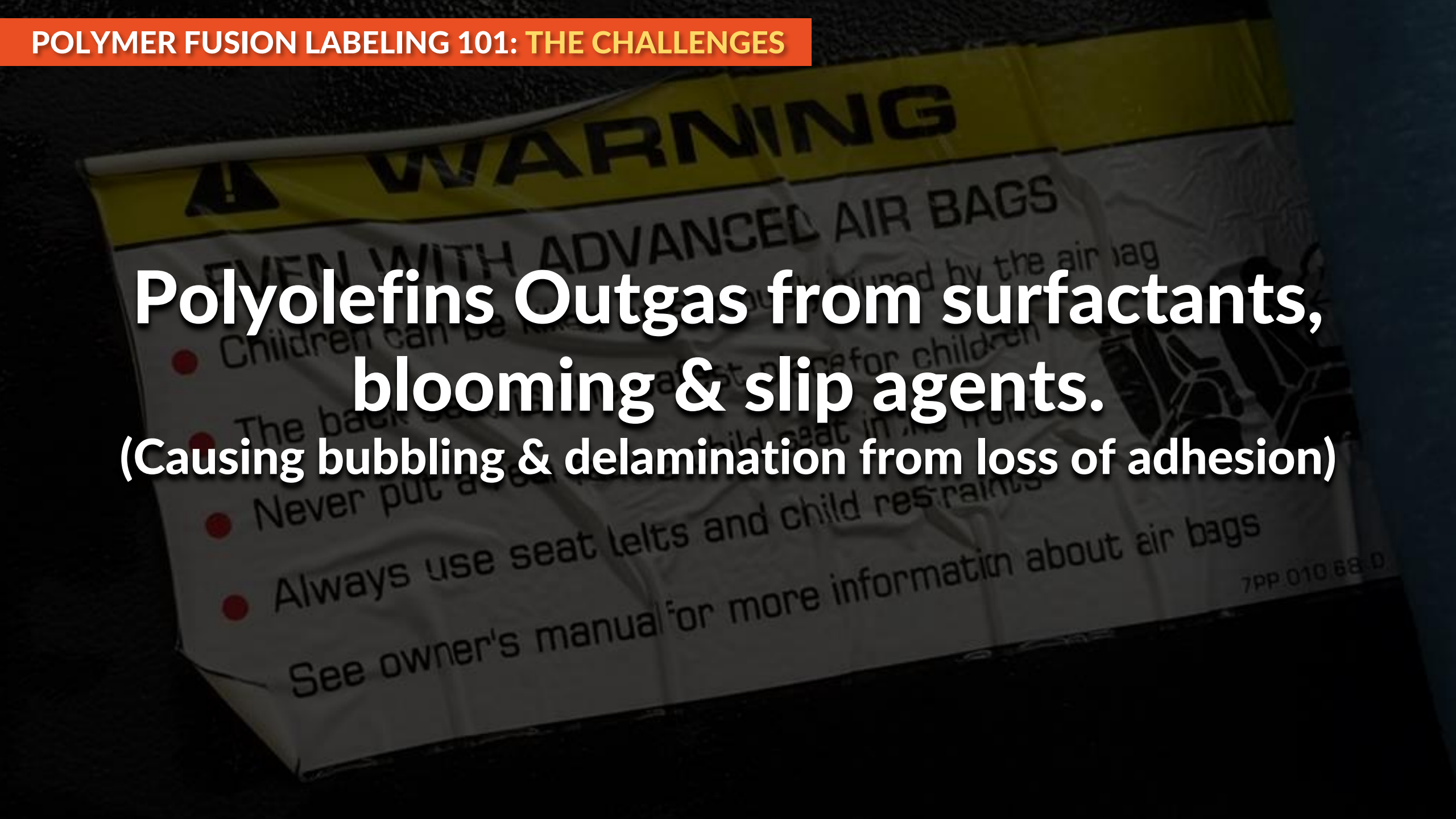
Substrate Surface Energies

		(dyne/cm)
HIGH	Stainless Steel	1100
	Aluminum	840
	Glass	250
LOW	LSE Polyethylene	31
	LSE Polypropylene	29
	Teflon	18

They expand/contract 18 times more than metals

(Adhesion-based labeling can’t causing exposure).



Polyolefins Outgas from surfactants, blooming & slip agents.

(Causing bubbling & delamination from loss of adhesion)

Standard Labeling Methods used on Polyolefin Thermoplastics

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STANDARD

LABELING

“Permanent” Pressure Sensitive Adhesive Labels

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ATTENTIC
ervoir a été controlé avant de quitter nos
s.
r lo du transport à ce qu'il ne soit pas
ommagé par des objets pointus ou tran-
hants.
réservoir doit impérativement être placé dans
ocal fermé et être protégé des ultra-violets.
t instal bien se conf
e dans un des bouchon


Step 1
Step 2
Apply brakes before loading.
Check brakes, wheels for
damage before moving.
VEOLIA
ENVIRONMENTAL
SERVICES


WARNING
Before transporting flammable liquids in this
vehicle, ALWAYS read your Owner's Manual.
• Always use containers designed for
off-road vehicles.
• Inspect containers for wear, cracks,
and leaks before each ride.
• Always make sure
firmly secured to avoid spills and damage.
Failure to follow proper instructions
could lead to burn injury and other
potential fire hazards.
7182513

STANDARD

LABELING

Hot-Stamp Foil

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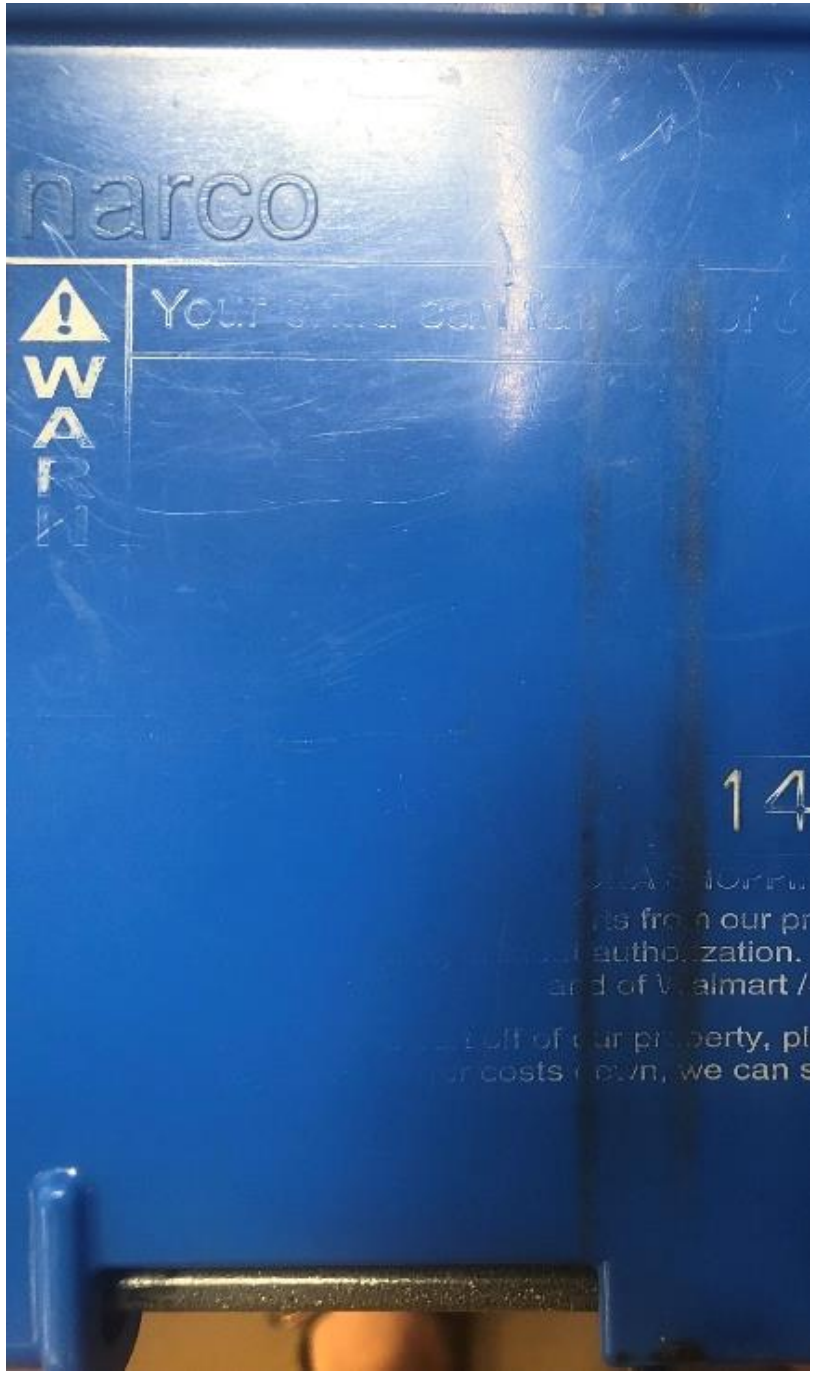
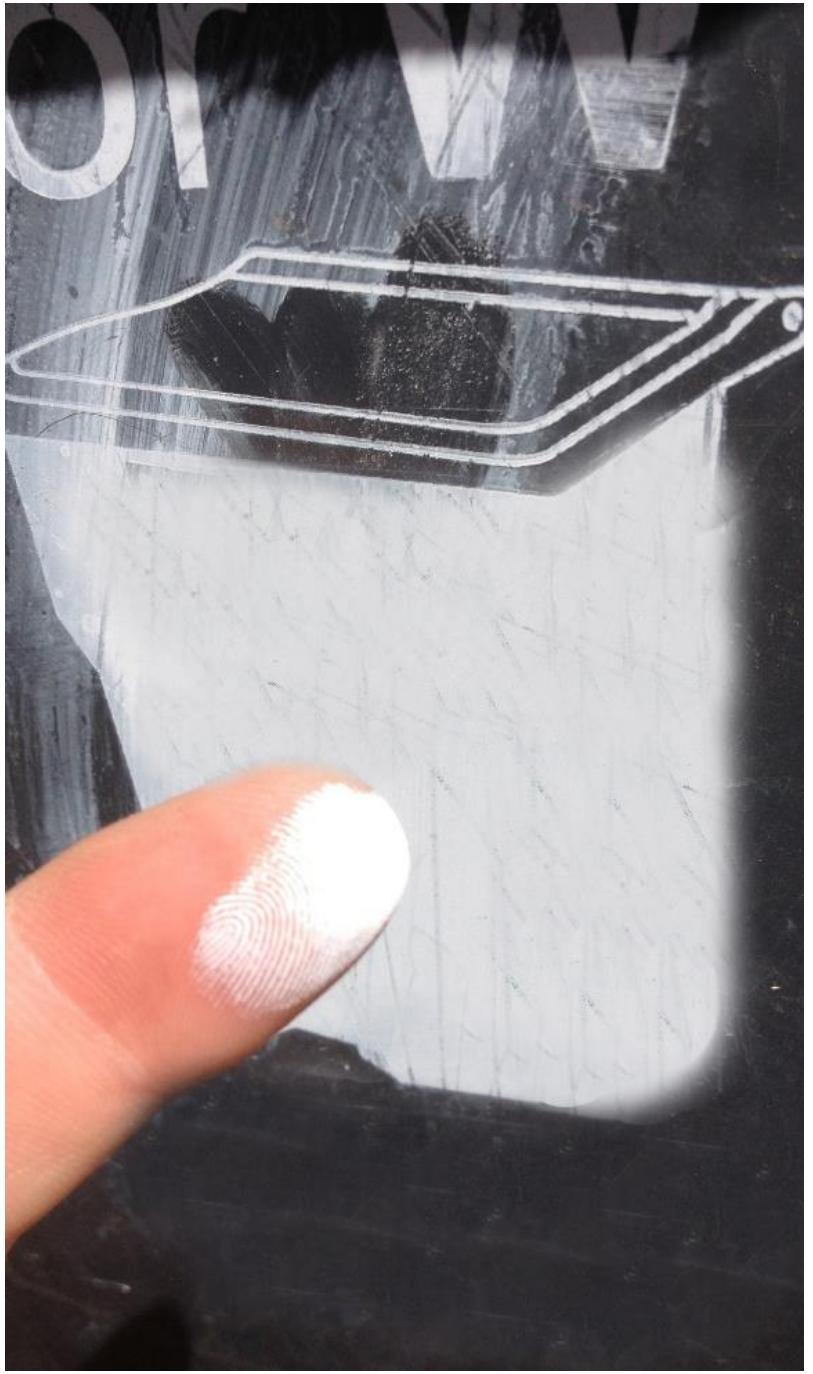

narco
WARN



STANDARD

LABELING

Heat-Transfer

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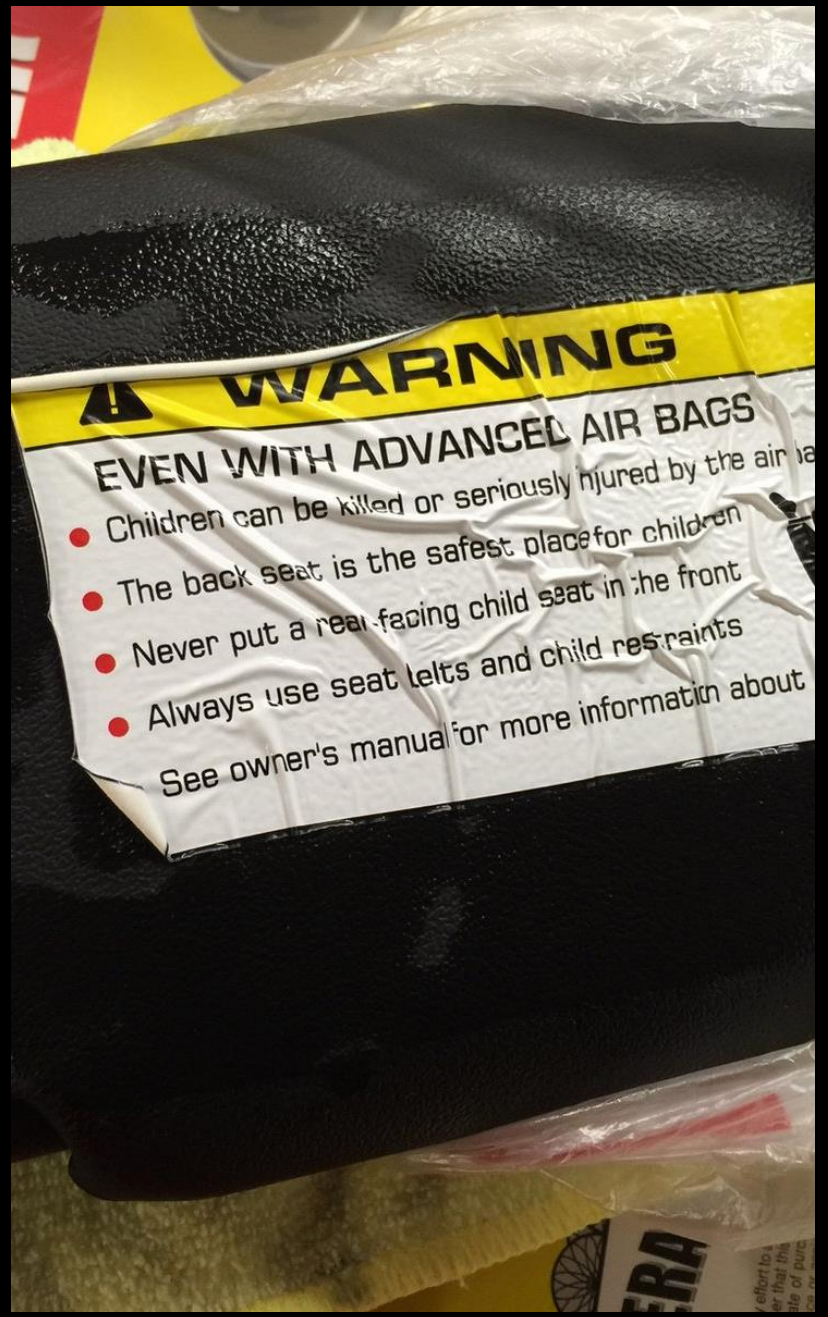
2-4
XP


WARNING
EVEN WITH ADVANCED AIR BAGS
Children can be killed or seriously injured by the air
The back seat is the safest place for children
Never put a rear-facing child seat in the front
Always use seat belts and child restraints
See owner's manual for more information about


Rubbermaid
Protected by:
Microban

STANDARD

LABELING

In-Mold Label

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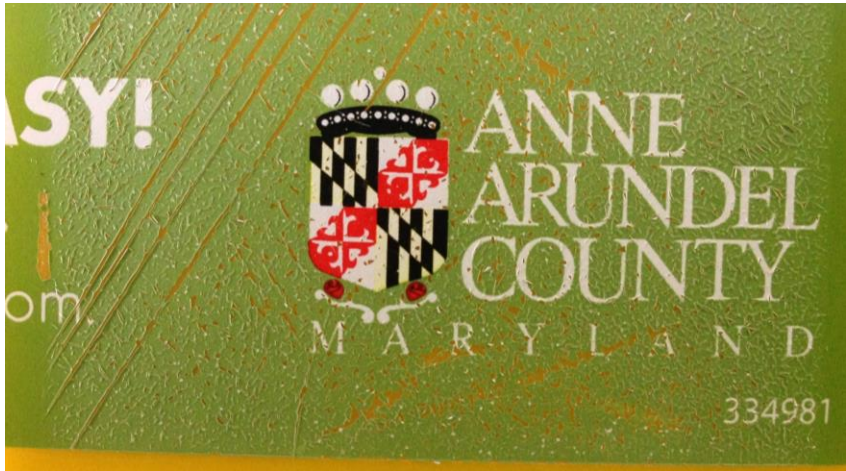
BY9
4


IN THIS CART:
Glass Bottles, Jugs & Jars
Plastic Containers (marked #1-#7) No Plastic Bags or Styrofoam
Newspapers, Magazines, Catalogs, Junk Mail, Cereal Boxes, Phone Books, Hard & Soft Cover Books
Aluminum & Tin Cans & Empty Aerosol Can
Cardboard (Flattened placed inside cart)


LOVE NZ
RECYCLE WITH CARE


ANNE ARUNDEL COUNTY
MARYLAND
334981

POLYMER FUSION TECHNOLOGY

FOR TRULY PERMANENT LABELING OF POLYOLEFIN THERMOPLASTIC REUSABLE PACKAGING

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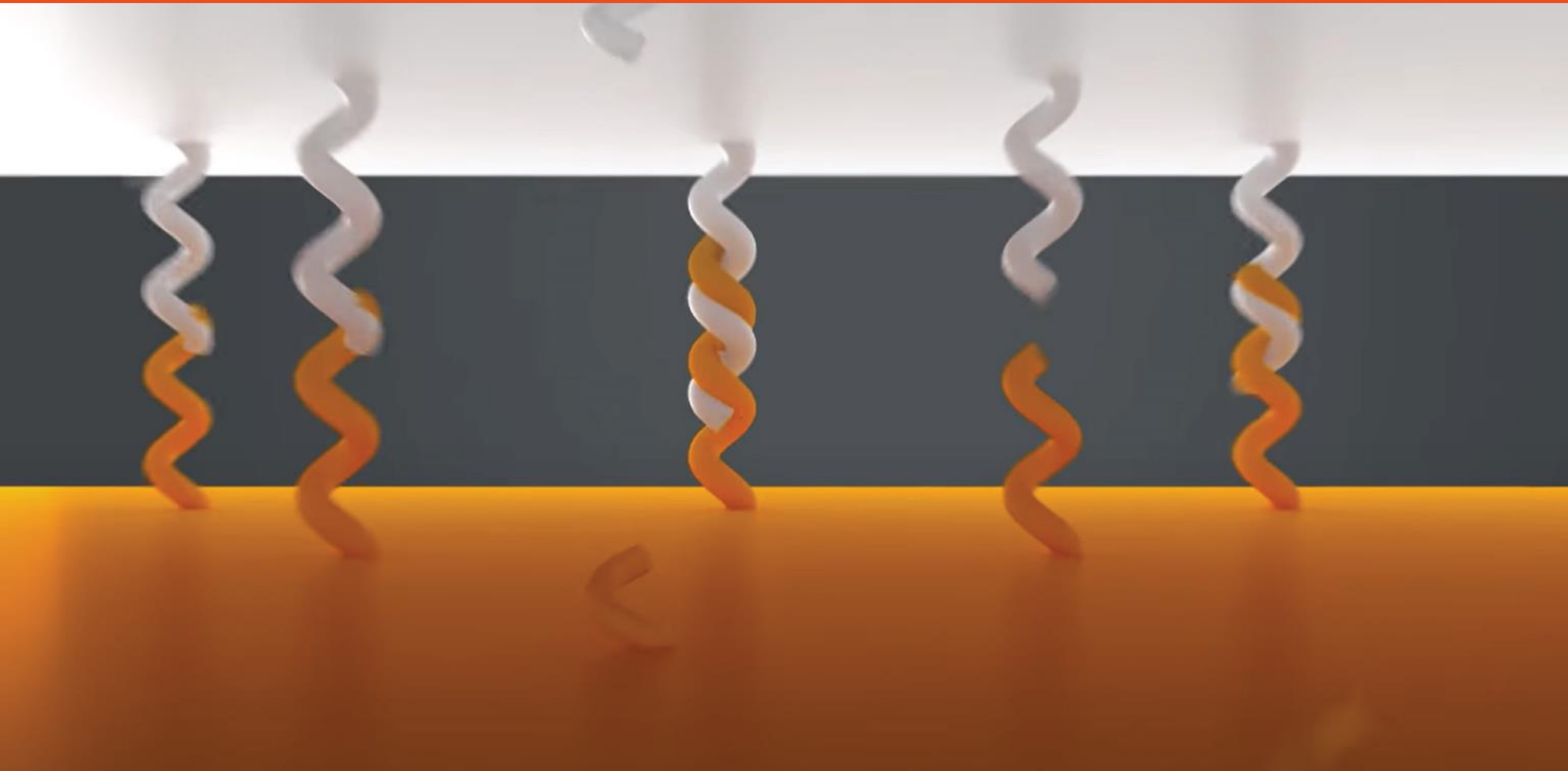
WHAT IS POLYMER FUSION TECHNOLOGY



The merging of two separate polyolefin thermoplastic polymers together *(polymer fusion label + polyolefin product)* using melt-point, time, and pressure to produce a singular piece of plastic without adhesives, tie layers, bonding agents, or use of secondary surface treatments.

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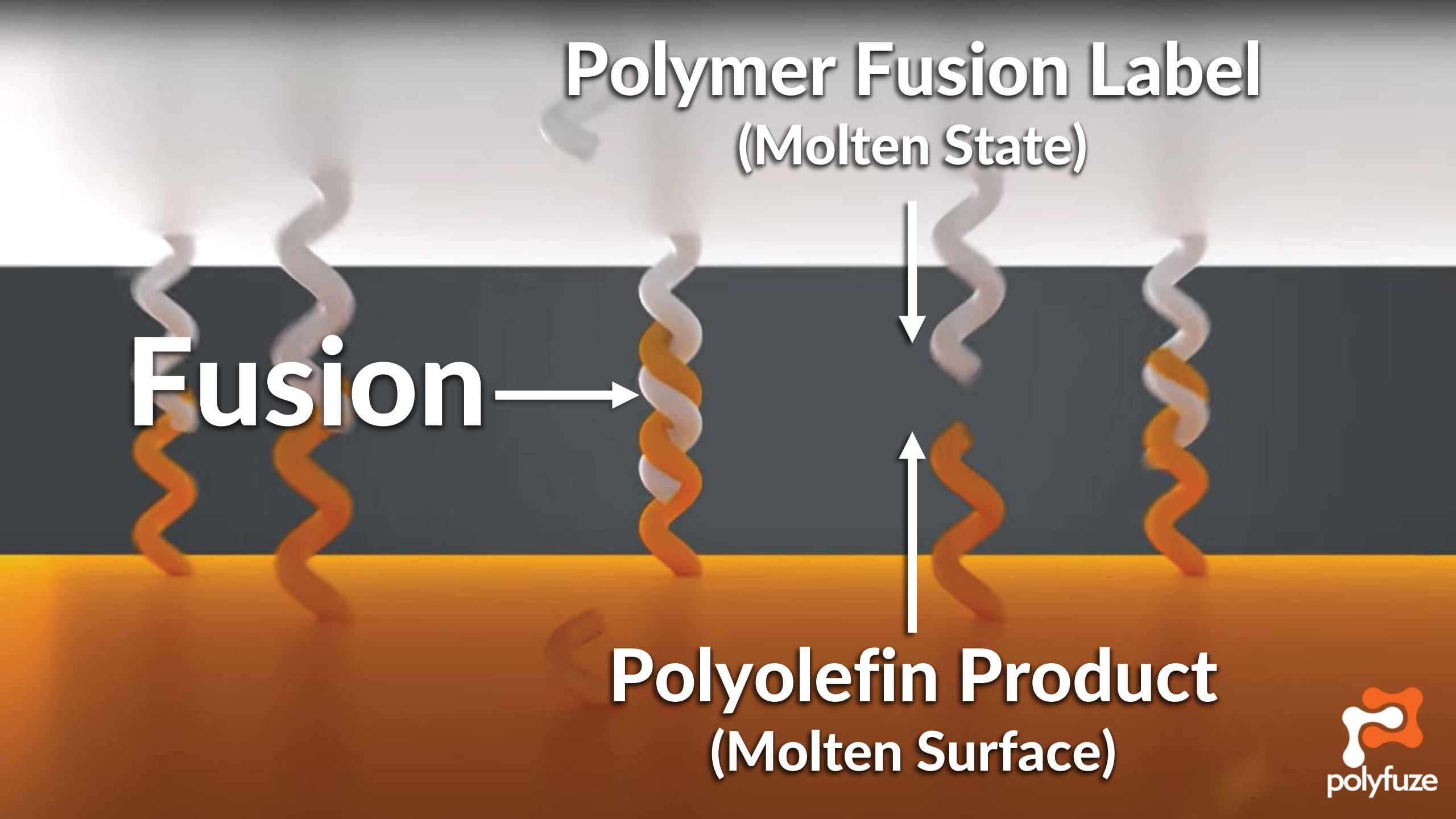
Polymer Fusion Label
(Molten State)
Fusion
Polyolefin Product
(Molten Surface)
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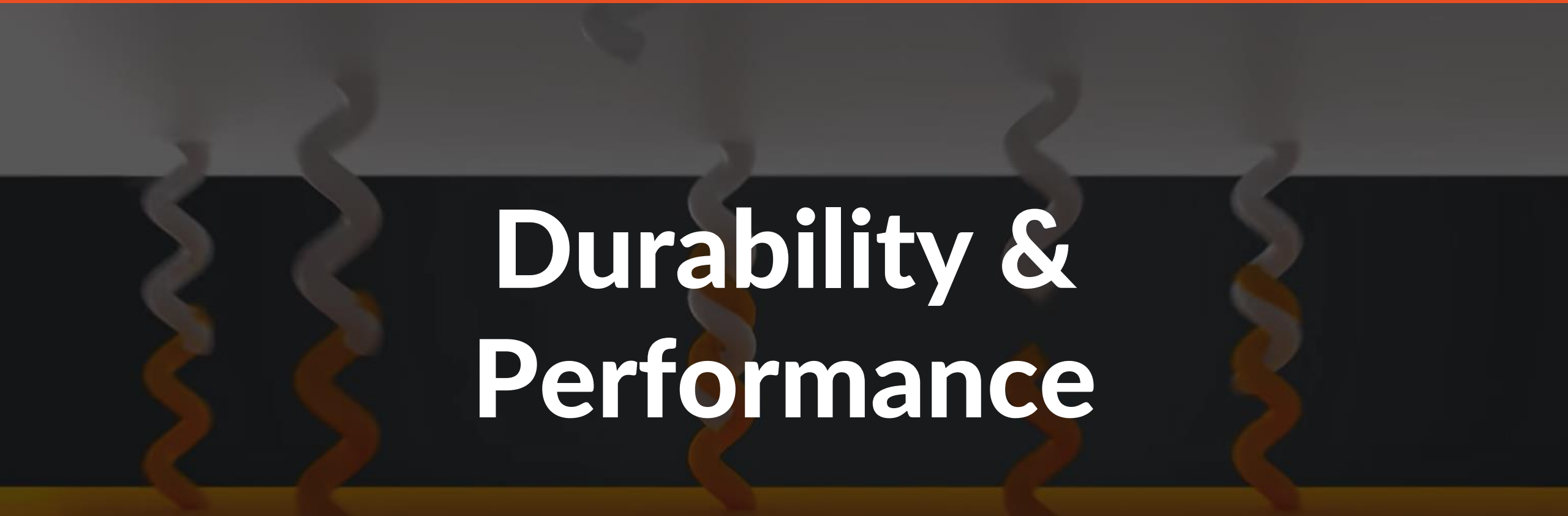
POLYMER FUSION TECHNOLOGY



Durability & Performance

Polymer Fusion Labels are impervious to UV, exposure to environmental elements, pressure washing, chemicals, oils, battery acid, solvents, water, extreme temperatures, and rigorous, repeated sanitation cycles.

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Polyfuze Test Data Report Snapshot

* **Tape Test ASTM D3359-09 Crosshatch:** Passed 100%
* **QUV Accelerated Weatherometer Test:** 2000 hrs. cycle, 8 hr. 70°C (158°F) with an Irridiance of 1. 4hr. at 50°C (122°F) condensation. 100% passed tape test, no color change.
* **Heat Test: at 77°C (170°F) for 120 hours):** 100% passed tape test.
* **Low Temperature Impact Resistance Test:** (40 lbs at -40°C) 100% passed tape test.
* **Flex Test:** (240 hours of continuous flexing at 21°C (70°F) 100% passed tape test.
* **Heat Cycle Test:** 2 hrs. -40°C, 2 hrs. 77°C (170°F) 100% passed tape test.
* **Pressure Wash Test:** 3 minutes at 1200 psi, 49°C (120°F) maximum temperature, 90 degree nozzle angle, six inches distance) 100% passed tape test.
* **Chemical Tests:** 21°C (70°F)

Type	Time Hrs	Result Tape Test	
Gasoline	168	100% pass	Soak
Diesel Fuel	168	100% pass	Soak
2 Cycle Engine Oil	168	100% pass	Soak
Lacquer Thinner	168	100% pass	Soak
Brake Fluid	168	100% pass	Soak
Turpentine	168	100% pass	Soak
Kerosene	168	100% pass	Soak
Muriatic Acid 20 baume 31.45%	168	100% pass	Soak
Alkali Solution (pH 13)	168	100% pass	Soak
Salt Water	720	100% pass	Soak
Water Immersion	720	100% pass	Soak

Polymer Fusion Label Solutions for Reusable Packaging:

- Brand Recognition
- Antimicrobial
- Authentication/Anti-Counterfeit
- Tracking/Tracing
- Safety/Warning
- Sustainability

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POLYMER FUSION TECHNOLOGY: SOLUTIONS

Branding

Your Brand Name & Logo are the instantly recognizable image of your Brand Identity and the symbol of your business in the mind of the consumer that sets your products apart from your competition.

Labeling representing your image can be a good thing …or a bad one! This depends on the quality of the labeling itself.

Polymer Fusion Labeling was specifically engineered for difficult to label LSE plastics and ensures the integrity of your brand image is never compromised.

POLYMER FUSION TECHNOLOGY: SOLUTIONS

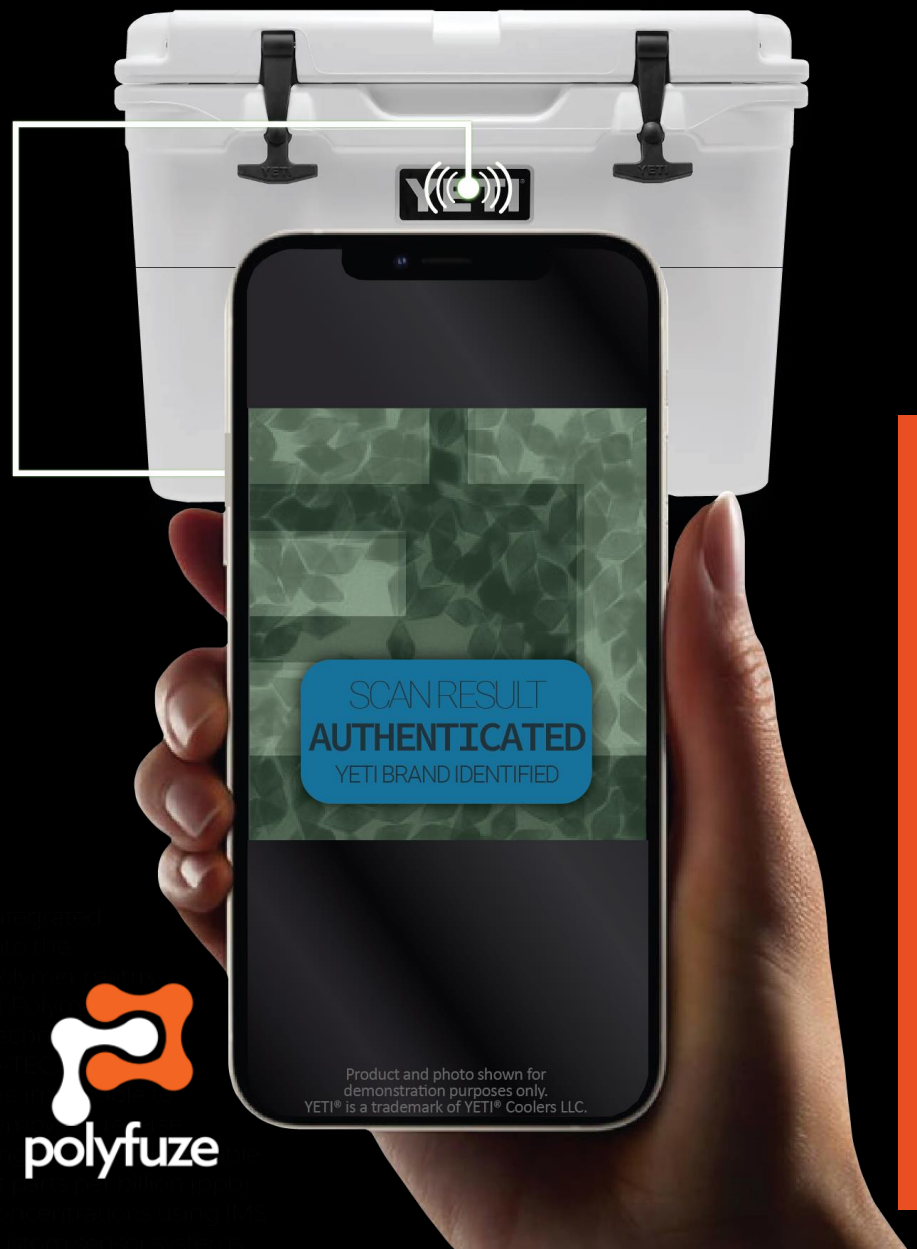
Antimicrobial

When labels fail, crucial biohazard safety information goes missing. Exposed layers and sticky adhesives become exposed sites where bloodborne pathogens and microbes harbor safely.

Polymer Fusion Labels are fused into the subsurface of the medical container and will never peel up, fade, or leave exposed layers for microbes to hide. The information the label denotes will always be legible and pristine, no matter the environmental or sanitation exposures.

As an additional layer of protection, Polymer Fusion Labels can be infused with BioCote®, a proven silver ion technology that is efficacious against bacteria, mold, and viruses.

POLYMER FUSION TECHNOLOGY: SOLUTIONS



Authentication

Anti-Counterfeit

As separate components, branded products and authentication labels can be easily counterfeited.

Polymer Fusion Labels with integrated D-TECT crystals (unique ID fingerprint) are fully fused and cannot be separated from the polyolefin thermoplastic product once applied, authentication & anti-counterfeiting becomes simple and practical to implement.

D-TECT crystals are impossible to remove or reverse engineer and detectable at parts per billion (ppb) concentrations using IMS custom sensor systems.

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POLYMER FUSION TECHNOLOGY: SOLUTIONS

Track / Trace

As separate components, branded products and track/trace labels can be easily counterfeited or removed, defeating the purpose of traceability.

Polymer Fusion Labels fully fuse and integrate into polyolefin products, they cannot be separated once applied and will never lift, peel, fade, or fall off, allowing 100% visibility and traceability through the supply chain for asset management.

Tracing then becomes simple, practical, and reliable to implement with any olefin products that typically present a labeling challenge with incompatible labels like stickers, hot stamps, heat transfers, pad-printing, or in-mold labeling.

POLYMER FUSION TECHNOLOGY: SOLUTIONS

Safety / Warning

When products pose possible risk of injury or death, labeling performs a vital and liable role. Label failure can result in costly litigation or product recalls.

Federal agencies like OSHA & CPSC give specific requirements on industry standards that all use “must be permanent” verbiage dictating how labels should perform.

Polymer Fusion Labels are fused into the subsurface of the plastic product and can never be lifted, separated, or erode no matter the environment or exposure.

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POLYMER FUSION TECHNOLOGY: SOLUTIONS

Sustainability

Grade A bales, or 94-95% indicated plastic, get the best price and are most sought after by buyers of recyclable HDPE. The remaining 5% is other incompatible materials that cannot be recycled with the plastic.

Labeling methods such as hot stamp, screen print, sticker, heat transfer, and IML's contain multiple layers of incompatible inks, coatings, substrates, and adhesives that end up as non-biodegradable waste. They must be removed prior to recycling which is labor-intensive, costly, and time-consuming.

Polymer Fusion Labels are made of 100% compatible polymer material with no inks, adhesives, or substrates. They are fully recyclable in one single seamless process right along with the product.

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POLYMER FUSION TECHNOLOGY

The Result?

The only truly permanent label technology exclusively made for use with reusable packaging manufactured from polyolefin thermoplastics to Brand, Authenticate, Track, Sanitize and Warn that's guaranteed for Life of Product.

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POLYMER FUSION TECHNOLOGY

Contact

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