Achieving Sustainable Packaging Solution Through Recyclable Mono Polymer Structure

Moving towards Circularity – Recyclable PE laminates

Constantia Flexibles

PLASTIC WASTE MANAGEMENT :

Life cycle analysis of Plastic packaging

8% RECYCLED

12% INCINERATED

80% LANDFILLS

Constantia Flexibles | Solution for Single Use Plastic in Multi-layer Packaging Material

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IS PLASTIC REALLY A PROBLEM ?

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A 2016 STUDY BY THE ENVIRONMENTAL CONSULTING FIRM

Trucost found:

- The environmental cost of using plastics is nearly four times less than the cost of alternative materials in goods/packaging.

- Using alternatives to plastics would increase the ***environmental cost from $139 billion*** *to* ***$533 billion annually… Ouch.***

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ECONOMY LOSSES DUE TO NON CIRCULAR ECONOMY

1. *Currently just 5% of material value of plastics packaging is captured after one use cycle, corresponding to $4–6 billion.*
2. *After a short first-use cycle, 95% of plastic packaging material value, or $80–120 billion annually, is lost to the economy .*
3. *linear consumption pattern of that sector, which sends goods worth over $2.6 trillion annually to the world's landfills and incineration plants.*

Reasons

A staggering 32% of plastic packaging escapes collection systems

Result

The cost of such after-use externalities for plastic packaging, plus the cost associated with greenhouse gas emissions from its production, is conservatively estimated at $40 billion annually – exceeding the plastic packaging industry's profit pool

Action Required

Shifting to a circular model could generate a $706 billion economic opportunity, of which a significant proportion attributable to packaging.

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Source: The New Plastics Economy: Rethinking the future of plastics

CREATE AN EFFECTIVE **AFTER-USE** PLASTICS ECONOMY

1. *New Plastics Economy actively mitigates the risk related to greenhouse gas emissions. Recycling one additional tonne of plastics, for example, reduces emissions by 1.1–3.0 tonnes of CO2e compared to producing the same tonne of plastics from virgin fossil feedstock[1].*
2. *Some bio-based plastics also have been shown to have a negative global warming potential with -2.2 kilogram CO2e per kilogram of bio-based PE produced compared to 1.8 kilogram CO2e per kilogram of fossil-based PE produced [2].*

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1. Deloitte, Increased EU Plastics Recycling Targets: Environmental, Economic and Social Impact Assessment – Final Report, 2015)
2. 4Tech and LCA works, *Environmental assessment of Braskem's biobased PE resin* (2013).

IS PLASTIC REALLY A PROBLEM ? OR A SOLUTION !!

Plastic is a miraculous product that mankind has ever developed and produced.

A product that is not deteriorating and has can be used for many purposes avoiding the use of other fast vanishing natural resources

Then whom should we blame for the issue **Plastic // People // System**

- Irresponsible behaviour society on littering the plastic waste
- **Absence of** **100% recyclable flexible packaging material**
- No value to those plastic waste hence even Rag Pickers do not pick up those waste from

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THE POSSIBLE SOLUTION FOR PLASTICS WASTE MANAGEMENT

1 End of Life Solution

- Pyrolysis
  380-430 deg C
- Energy Recover
  (Cement Plant)
- Road Construction

2 Bio degradable and Bioplastic

- Infrastructure Requirement
- Need Feedstock
- Higher Cost
- Barrier Requirement
- Increase in Carbon Footprint

3 Recyclability

- Compatible Recycling
- Limited Compatible Recycling
- Non Compatible Recycling

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THE POSSIBLE SOLUTION FOR PLASTICS WASTE MANAGEMENT

1 End of Life Solution

Pet / Poly

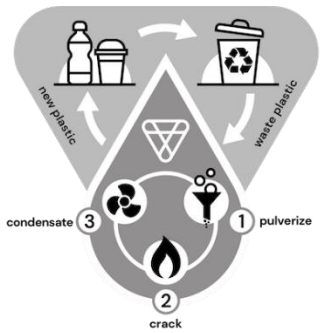
Pet / Met pet / Poly

Pet / Foil / Poly

BOPP / PE

BoPP / Met BoPP / PE

a) Pyrolysis
380-430 deg C

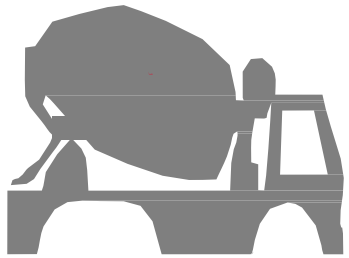


50-90% Industrial Diesel

10-15% Gas

5-10% Carbon

b) Energy Recover
(Cement Plant)

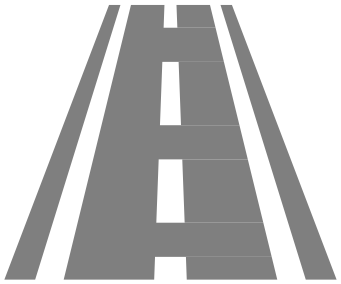


Plastic waste of waste quality

Mixture of plastic and paper

Environment and economical aspects

c) Road Construction



Aggregate

Bitumen(TAR)

Plastics waste

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THE POSSIBLE SOLUTION FOR PLASTICS WASTE MANAGEMENT

2 Bio degradable and Bioplastic

a) **Infrastructure Requirement**

a) Needs composting Infrastructure

b) Depends on Moisture, pH, Temperature and Microbes

b) 

Need Feedstock

c) 

Higher Cost

d) 

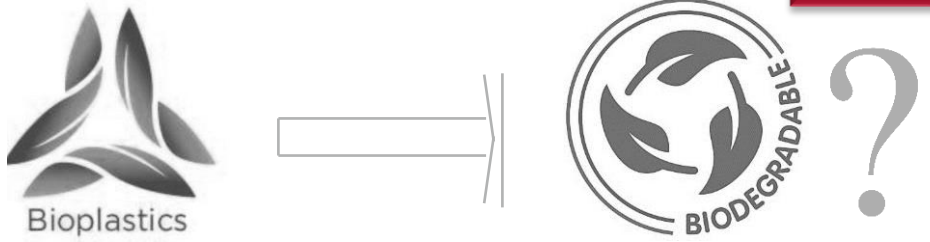
Barrier Requirement

e) 

Increase in Carbon Footprint

f) **Bioplastic**

Biodegradable ?



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THE POSSIBLE SOLUTION FOR PLASTICS WASTE MANAGEMENT

3 Recyclability

MOST Preferred Choice

a) Compatible Recycling

Permitted Limits		*Not Permitted*	
PE or PP Content	*Minimum 90%*	PE or PP Content	*PVC/PVDC/PET /Biodegdable*
Barrier Coating (EVOH/AlOx, SiOx/Metallization)	*5% of total weight for flexible packaging*	Barrier Coating	*PVDc/Al Foil*

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DESIGN FOR RECYCLING AND SUSTAINABILITY

b) Limited Compatible Recycling

Permitted Limits		Not Permitted	
PE or PP Content	*Minimum 80%*	PE or PP Content	*PVC/PVDC/PET /Biodegdable*
Barrier Coating (EVOH/AlOx, SiOx/Metallization, Acrylic coating)	*10% of total weight for flexible packaging*	Barrier Coating	*Al Foil*

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THE POSSIBLE SOLUTION FOR PLASTICS WASTE MANAGEMENT

c) Non Compatible Recycling

Permitted Limits		Not Permitted	
PE or PP Content	*Less than 80%* *including PVC/PVDC/PET/Biodegdable*	PE or PP Content	*Nil*
Barrier Coating (Acrylic/PA/EVOH/AlOx, SiOx/Metallization)	*More than 10% of total weight including PVDc/Al Foil*	Barrier Coating	*Nil*

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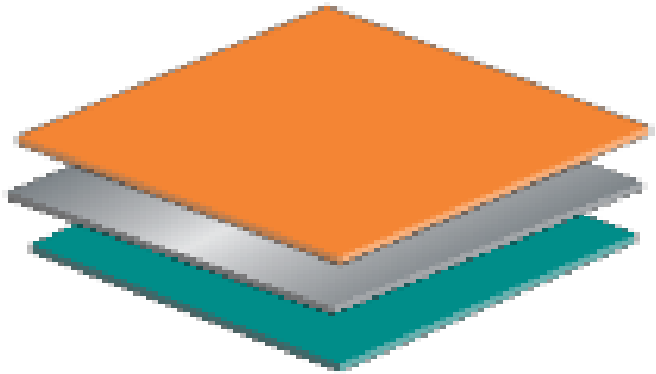
THE PROBLEM

- A packaging material need multiple properties to protect/preserve the product.
- Those properties are not exhibited by a single polymer film.
- Different films carries different properties.
- They are laminated to make a composite structure that fulfils overall requirement of the **PACKAGE.**
- This composite laminate due to different films, it becomes ***NON-RECYCLABE.***
- **THE PROBLEM ::: *NON-RECYCLABE.***



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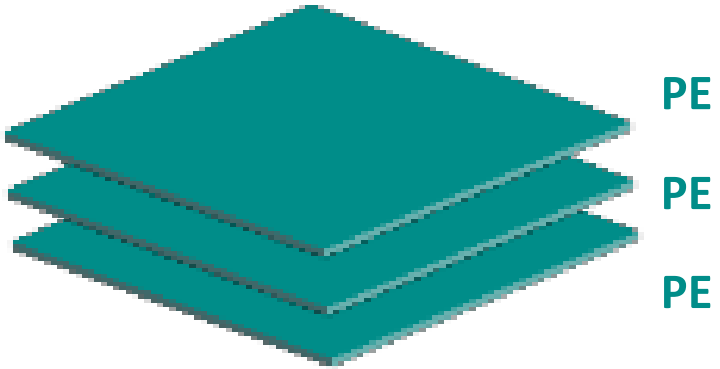
THE SOLUTION

- A laminate made out of same polymer, eg. All PE.
- A Mono polymer based Films developed through research and development that acquires different properties needed.
- Those films are laminated to make a composite structure which fulfils overall requirement of the package in all respect.
- This laminate due to mono-material nature, becomes **RECYCLABLE.**
- **THE SOLUTION ::: *RECYCLABLE***



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Certifications of Recyclability

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Recyclability Certificates

EXAMINATION PROTOCOL

Recyclability of Packaging Base Material

Constantia Flexibles International GmbH
Rivergate, Handelskai 92
A-1200 Vienna

The company receives the examination protocol of recyclability for the following packaging.

Designation

Ecolam High Plus in applications without additional components (Laminate for packagings like flowpacks, pouches and bags)

Option 1) > DIN A4

Option 2) < DIN A4

Test result

Allocation to path/specification:	**Option 1) Plastic foil, Fraction No. 310, 310-1**
	Option 2) Mixed Polyolefins, Fraction No. 323
	Mixed Plastics, Fraction No. 350, 352
Recycling path:	**Option 1) Plastic foil, Fraction No. 310, 310-1**
	Option 2) Mixed Polyolefins, Fraction No. 323
Recyclate (final product):	**Option 1) PE-regranulate**
	Option 2) PO-regranulate

Test standard/ scope of application: Requirements and assessment catalogue of the institute cyclos-HTP (state of 10.07.2018)

In accordance with the test results and the examination documents the recyclability of the packaging amounts to:

Option 1) 91 %*

Option 2) 82 %*

* This examination protocol is no certification of the final packaging. For the final assessment and for the purpose of issuing a certificate the final packaging has to be available. Therefore, the figure mentioned above is conditionally granted.

Aachen, dated 17.08.2018

Dr. Joachim Christiani
Publicly appointed and sworn expert for the IHK for packaging waste disposal
Competent authority: IHK Aachen-Aachen und vereidigter Sachverständiger

Examination documents (No. 2072-2018-000345) with 8 following pages

Institute cyclos - HTP

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CIPET/R&D-Consultancy/2018-19/27/80

16.11.2018

TO WHOMSOEVER IT MAY CONCERN

This is to certify **PE/PE Film,** that co-extruded laminated multilayer film can be recycled which is a coextruded film of LDPE/LLDPE blend. The recycling of co-extruded LDPE/LLDPE laminated multilayer film and thereafter properties evaluation like mechanical property, Physical Properties, Thermal Properties, Rheological Properties and Spectroscopy was conducted on recycled product. It was found that thermal stability and mechanical properties of the recycled blend showing almost similar properties of PE.

The certification on recyclability is applicable pertain to **PE/PE Film,** co-extruded laminated multilayer film only.

The above statement is based on Consultancy Report No. **CIPET/Development Work/2018-19/27 dated 16.11.2018**

Authorized Signatory Authorized Signatory Authorized Signatory

Issue to:

M/s Parikh Flexibles Pvt. Ltd, India
Parikh Packaging Pvt. Ltd.
(Constantia Flexibles GMBH)
Opp. Rotomac Pen, Moraiya,
Ahmedabad, Gujarat-382213

केन्द्र : अहमदाबाद, अमृतसर, औरंगाबाद, अगरतला, बद्दी, बालासोर, बेंगलुरु, भोपाल, भुवनेश्वर, चन्द्रपुर, चैन्नै, गुरुग्राम, गुवाहाटी, ग्वालियर, हैदराबाद हाजीपुर, हल्दीया, इम्फाल, जयपुर, कोच्चि, लखनऊ, मदुरै, मुरथल, मैसुर, रायपुर, राँची, वलसाड एवं विजयवाड़ा

entres : Ahmedabad, Amritsar, Aurangabad, Agartala, Baddi, Balasore, Bengaluru, Bhopal, Bhubaneswar, Chandrapur, Chennai, Gurugram, Guwahati, Gwalor, Hydrabad, Hajipur, Haldia, Imphal, Jaipur, Kochi, Lucknow, Madurai, Murthal, Mysuru, Raipur, Ranchi, Valsad & Vijaywada

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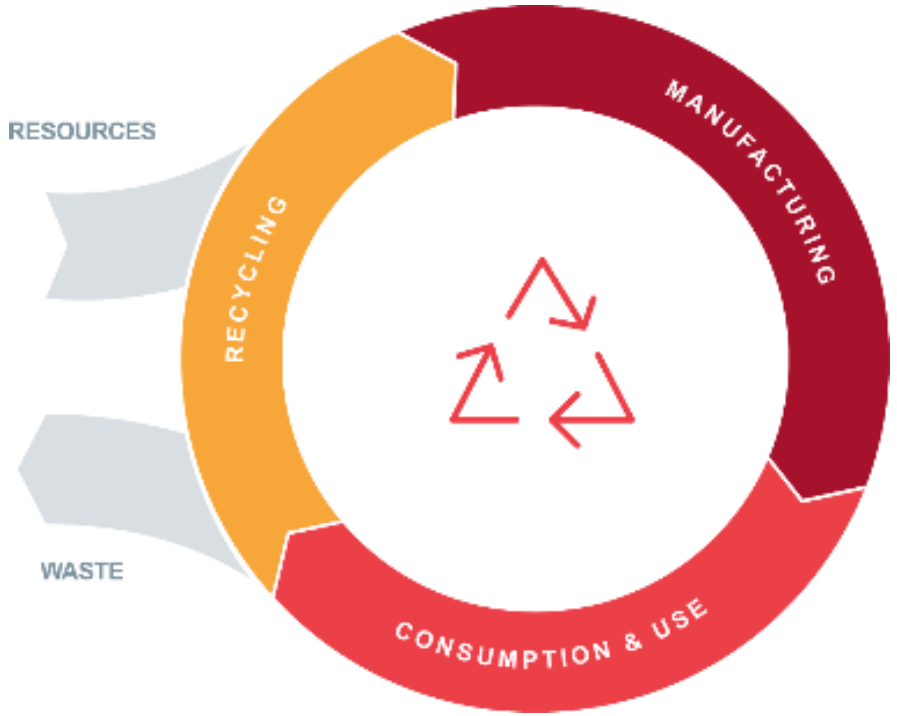
WHAT MAKES CONSTANTIA ECOLAM NOVEL

Similar barrier to current ABL
laminate 220/12 when metallised and similar to PBL 300/15 when non metallised

Re-cyclable as HDPe, laminate certified
in Europe and in India

Feel good factor to the consumer
from purchasing a ‘sustainably’ packaging product

Ready for the circular economy



Recycling certified by

CIPET, India

Institute of Cyclos, Eurpoe

Constantia Flexibles

Evolution of EcoLam:

Constantia Flexibles

Solution for Single Use Plastic in Packaging Material

The plastic packaging solutions as it stands today...

PROS

- High barrier
- Better shelf life
- 100% Recyclable
- High value in waste

CONS

- Non-recyclable
- Ends up in oceans/landfills
- Low barrier
- Shorter shelf life

Introducing EcoLam, the future of recyclable packaging

EcoLam is a breakthrough material innovated and developed in-house at our state-of-the-art facility in Gujarat, India. It combines the pros of existing PE/PE & PE/PET material while eliminating the cons of both the materials.

EcoLam® by Constantia Flexibles

PROS

- High barrier
- Better shelf life
- 100% Recyclable
- High value in waste

Recyclable Solution For Different Applications :

EcoLam® by Constantia Flexibles

EcoLamPlus® by Constantia Flexibles

EcoLamHighPlus® by Constantia Flexibles

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EcoLam (Moisture Barrier)

Applications

- General Purpose Application
- No need for critical values of barrier or a regular Moisture barrier is needed. Eg.
  - Salt, Sugar, Spices, Noodles, Pasta
  - Detergent
  - Paints, etc.

Features

- Lap Sealable and Line (weld) sealable.
- Reduction in consumption.
- MVTR - 6 – 8 gm/sqm/day.
- Supply in Both Preform bags and reel form.
- Run on existing FFS line with little or no modification

EcoLam® by Constantia Flexibles

Constantia Flexibles

EcoLamPlus (Enhanced Oxygen Barrier)

Applications

- Medium to High Barrier Application.
- Where barrier for both MVTR and OTR are not extremely Critical.
  - Cream, Shampoo
  - Snacks

Features

- Lap Sealable, Line (weld) seal hence better strength, reduction in laminate consumption.
- MVTR 6 – 8 gm/sq.mtr/day
- OTR - 1.5 cc/sq.mtr./day
- Supply in Both Preform bags and reel form.
- Run on existing FFS line with little or no modification

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EcoLamHighPlus (Excellent Moisture and Oxygen Barrier)

Applications

- PE/ PE Laminate for Extreme Barrier Application
- Oxygen/ Moisture and Aroma barrier
  - Coffee, Tubes, Infant Nutrition
  - Snacks, Cookies

Features

- Lap Sealable, Line (weld) seal
- MVTR - 0.15 gm/sq.mtr/day
- OTR - 0.1 cc/sq.mtr./day
- Supply in Both Preform bags and reel form.
- Run on any existing FFS line with little or no modification

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TARGET 2025 TOWARDS SUSTAINABILE CLOSE LOOP **CIRCULAR ECONOMY**

2025 Target

Packaged goods, companies, retailers, hospitality and food service companies, Packaging Producers

1 *Take action to* ***eliminate*** *problematic or unnecessary plastic packaging*

2 *To take action to move from single use towards* ***reuse*** *model where relevant*

3 *100% of plastic packaging to be reusable,* ***recyclable*** *or compostable*

4 Set an ambitious ***recyclable content*** target across all plastic packaging used

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UNDERSTANDING VALUE IN THE SUPPLY CHAIN

Moving from single use to circularity is dependent on infrastructure

	1st cycle	2nd cycle	3rd cycle	4th cycle	5th cycle	6th cycle	7th cycle
Life Cycle for PP based Laminates BOPP laminates BOPP/Pe laminates	 Original pack	 Plant pots beds	 truck **End of life** energy, roads, pyrolysis	BOPP PCR cannot be used for BOPP manufacture, can only be downcycled			
Life Cycle for PE based Laminates Pe / Pe laminates EcoLam	 Original pack	 Can be Re-used in making films for Non-Food Applications	 Partial use in film Carry Bags Container for Detergent Agro Product	 Garbage Bags Picnic Table Garden Furniture	 Box Strapping Barsati Cover Truck Bed	 Road Divider Fences	 Various other application before **end of life** and energy

The above depends on the proportion of PCR to virgin resin that is used.

Based on mechanical recycling

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The results reported based on the recyclability studies carried out at CIPET

In every handshake with nature, one receive more than what is expected.

Constantia Flexibles

www.cflex.com