

CHEMISTRY THAT MATTERS™



# DRIVING DESIGN FOR RECYCLABILITY IN FLEXIBLE FOOD PACKAGING

SABIC WEBINAR

MDTS EUROPE  
FEBRUARY 23<sup>RD</sup> 2021



## PRESENTER

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**Vivianne Munnix**  
**Engineer Market Development and Technical Support**  
**BU Petrochemicals, Europe**

Vivianne is responsible for market development and technical support within flexible food packaging in Europe. She holds a degree in Food Science and Technology and worked at food producing companies in the past. After joining SABIC in 2011 she held various roles. From 2016 onwards, she is part of the market development and technical support team with a strong focus on flexible food packaging.

## AGENDA



- INTRODUCTION
- SABIC'S TRUCIRCLE™ PROGRAM
- DESIGN FOR RECYCLABILITY IN FLEXIBLE CONSUMER FOOD PACKAGING
  - FROZEN FOOD PACKAGING
  - MONO PE STAND-UP POUCHES
  - PVC FREE CLING FILM
- CONCLUSIONS

DRIVING DESIGN FOR RECYCLABILITY IN FLEXIBLE FOOD PACKAGING

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# WHO WE ARE

# SABIC AT A GLANCE



1976

Company established



33,000

Employees around the world



50

Countries of operations



3<sup>rd</sup>

Largest global chemical company\*



212<sup>th</sup>

Largest public company in the world\*

4.017

US\$ bn

Estimated Brand Value\*\*

82.6

US\$ bn

Total assets

1.5

US\$ bn

Net income

37.3

US\$ bn

Annual revenue



≈ 150

New products each year



12,540

Global patent filings



68

World-class plants worldwide

## POLL QUESTION 1

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WHERE DO YOU SEARCH THE RIGHT MATERIAL WHEN DEVELOPING A NEW PACKAGING PRODUCT?

Material supplier website

Material search platforms

Direct contact current supplier

Recommendation from other stakeholders in the value chain

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# INTRODUCTION

# THE COMMON CHALLENGE

## EXISTING BENEFITS



LIGHTWEIGHT - STIFFNESS -  
IMPACT - DURABILITY - COST -  
SAFETY - APPEARANCE

## ISSUES TO BE SOLVED





## DESIGN FOR RECYCLABILITY

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### The packaging dilemma

Can't continue using current packaging methods,  
but you cannot abandon them either

#### PUBLIC OPINION

Social responses on the problem

- stop pollution of our environment
- reduce & clean up the mess
- increase the amount of recycling

#### INDUSTRY REACTION

Design for Recyclability

- Increase the amount of recycling
- Improve recycling rate
- Reduce complexity of packaging materials used

### LAMINATION PACKAGING: MAIN CHALLENGE

## POLL QUESTION 2

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### WHAT IS YOUR PRIMARY CHALLENGE IN YOUR PACKAGING PRODUCTION TODAY?

Economics: improving the operation efficiency and cost

Sustainability

Compliance with EU regulations

Consumer convenience

Preservation & protection

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# SABIC'S TRUCIRCLE™ PROGRAM

# SABIC'S TRUCIRCLE™ PROGRAM

PORTFOLIO



SERVICES



## CLOSING THE LOOP AND CREATING A CIRCULAR ECONOMY FOR PLASTICS

DRIVING DESIGN FOR RECYCLABILITY IN FLEXIBLE FOOD PACKAGING

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# DESIGN FOR RECYCLABILITY IN FLEXIBLE CONSUMER FOOD PACKAGING

# 3 EXAMPLES OF SUCCESSFUL MONO-PE INTRODUCTIONS

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FROZEN FOOD PACKAGING



MONO-PE STAND-UP POUCH



PVC FREE CLING FILM

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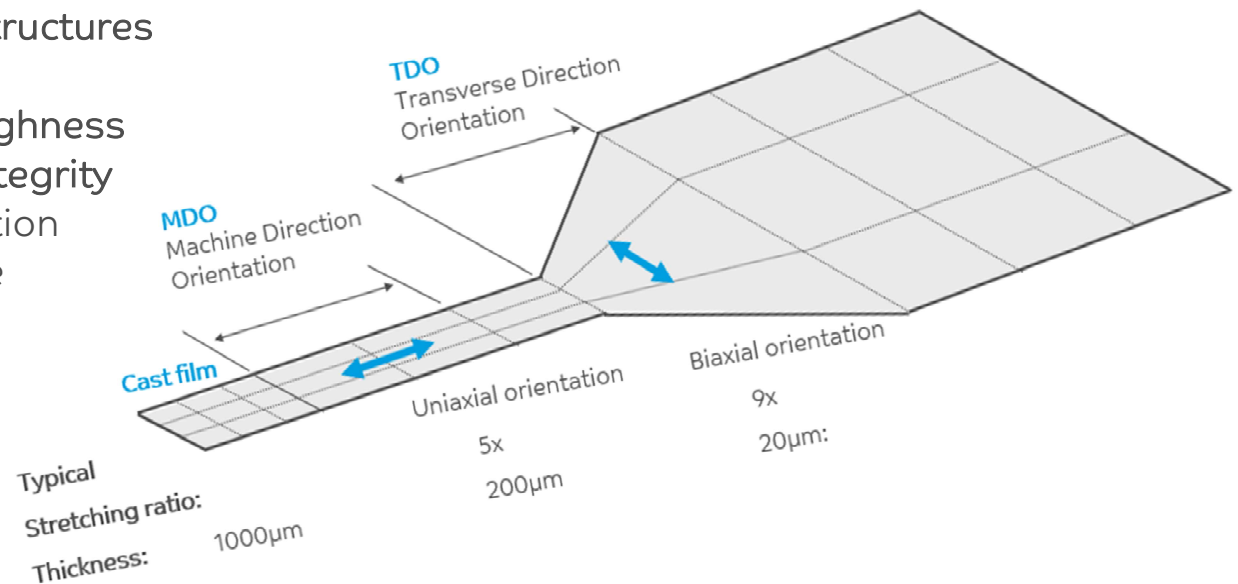
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# FROZEN FOOD PACKAGING

## DESIGN FOR RECYCLABILITY - BREAKTHROUGH WITH TF-BOPE

### BIAXIALLY ORIENTED PE FILM EXTRUDED AT BOPP TENTER FRAME LINE

- Opportunity for mono-material PE structures
- Very good planarity and printability
- High mechanical properties and toughness
- Potential for class leading sealing integrity
- **Easy opening** – controlled tear direction
- Suitable for coating and metallizable



 BIAXIALLY ORIENTED PE FILMS MADE WITH NEW SABIC® PE GRADES CAN OVERCOME THE LIMITS OF CONVENTIONAL PE FILM



# EASY OPENING GIVING IMPROVED CONVENIENCE

TEAR DIRECTION

*TF-BOPE FILM GIVES LINEAR TEAR IN PREFERRED TRANSVERSE DIRECTION*

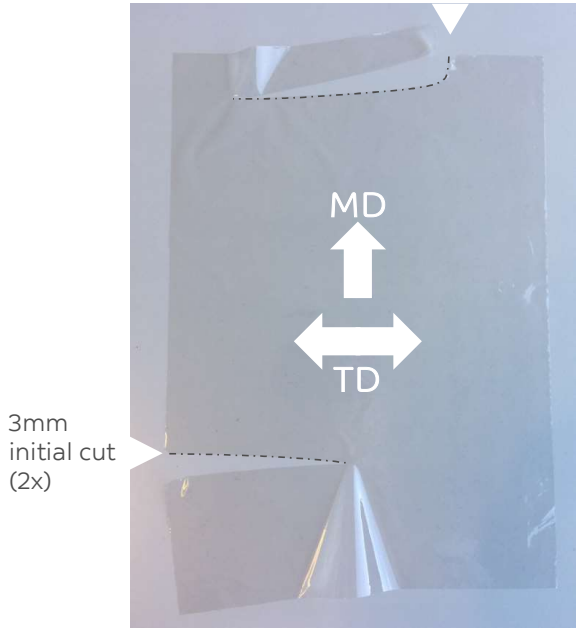
## VALUE PROPOSITION

### CONSUMER CONVENIENCE

→ *Controlled linear tear* direction features easy opening & avoids frustration at consumers when opening packaging

Also Machine Direction tear curves into Transverse Direction

Assumption: deviation of preferred tear from TD correlates with bowing of film



# POTENTIAL FOR CLASS LEADING SEALING INTEGRITY

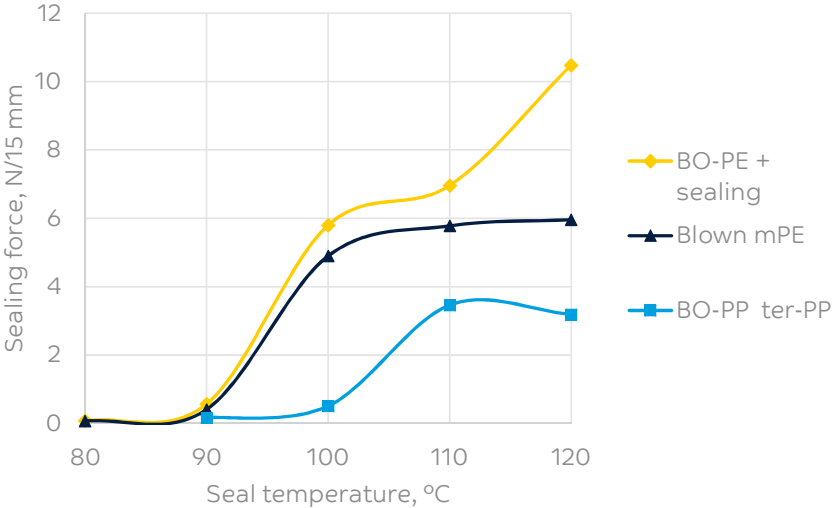
## SEALING PERFORMANCE

*TF-BOPE SOLUTIONS OUTPERFORM INCUMBENT BOPP & ALLOW HIGHER PACKAGING SPEED*

**VALUE PROPOSITION**  
**PERFORMANCE**  
→ *Reduced risk of leakages* in heat sealed joints  
→ *Improved sealing force* preventing food waste  
→ *Improved heat sealing behavior*; lower SIT  
→ *Broad hot tack window*

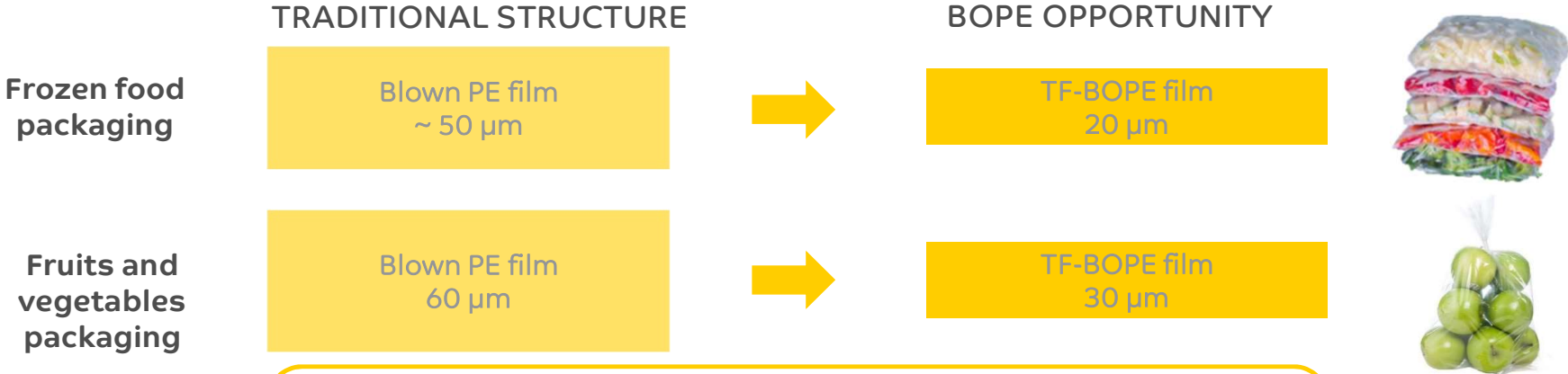


SEAL STRENGTH



# DOWN GAUGING & RAW MATERIAL REDUCTION

**DOWN GAUGING** *TF-BOPE SOLUTIONS HELP TO REDUCE RAW MATERIAL CONSUMPTION IN MANY APPLICATIONS*



- VALUE PROPOSITION**
- *Down gauging opportunities up to 50%*
  - *Higher production throughput*
  - *Lower plastic packaging tax (lower packaging weight)*
  - *Less CO<sub>2</sub> per plastic packaging*

# EXAMPLES OF TF-BOPE APPLICATIONS

**Food re-closable bag**



**BOPE film**

**Chilled food packaging**



**BOPE anti-fog**

**Bread packaging**



**BOPE 20 µm**

**Fruit packaging**



**BOPE 30 µm**

**Pillow pouch**



**BOPA replacement**

**Stand-up pouch**



**100% PE**

**Frozen food packaging**



**100% PE**

## TF-BOPE FOR FILM CONVERTORS & PACKAGING CONVERTORS

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### DESIGN FOR RECYCLABILITY

- TF-BOPE facilitates mono-material PE structures



### SUSTAINABILITY & RELIABILITY

- Food waste reduction & leakage prevention as a consequence of improved packaging integrity & increased seal strength (both compared to BOPP film)
- Available as certified circular and certified renewable polymer



### ECONOMICS & PERFORMANCE

- Down gauging opportunities compared to blown PE film
- TF-BOPE film can be produced on BOPP line (throughput of ~2 ton/h)  
Higher throughput compared to standard blown PE film (throughput ~0,5 ton/h)



### CONSUMER CONVENIENCE

- Potential to get unique tear propagation behavior

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# MONO-PE STAND-UP POUCHES

# DESIGN FOR RECYCLABILITY



## A MONO-PE STAND-UP POUCH SOLUTION



Lamination film	20 µm	PE
Outer layer	17 µm	SUPEER™ 7118NE + LDPE 2501NO
Core layer	35 µm	HDPE F04660 + SUPEER™ 7118NE
Sealing layer	8 µm	COHERE™ S100 + LDPE 2501NO

### MATERIAL PROPERTIES

- COHERE™ S100 → sealing properties
- SUPEER™ 7118NE → mechanical properties
- Lamination film → optics & good (reversed) printing required for extra mechanical properties



Both are non-barrier pouches

## ENHANCED SEALING WITH COHERE™ S100

**LOWER SEALING INITIATION TEMPERATURE** with COHERE™ S100 in sealing layer of a typical 3-layers blown film:



**PROCESSING**

- Enables faster packaging line speed



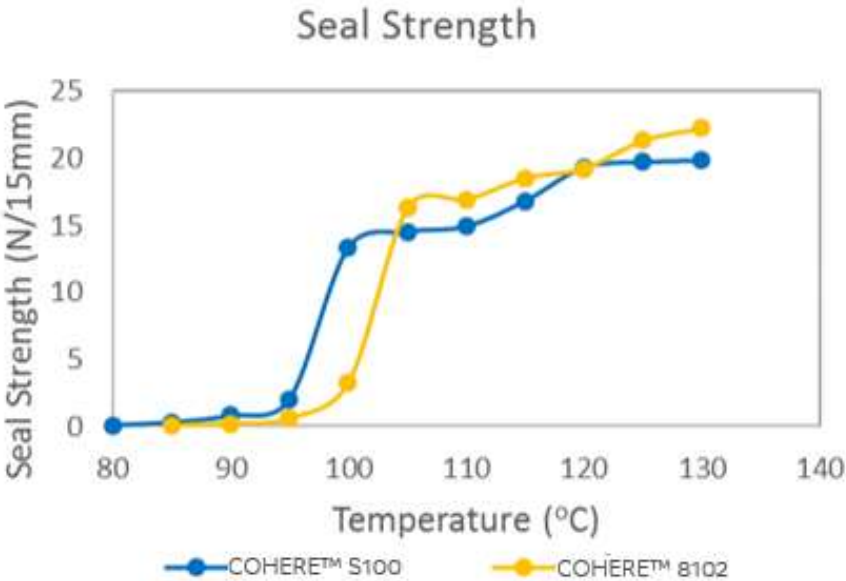
**PROTECTION**

- Wider heat sealing process window



**CONVENIENCE**

- Excellent optical properties

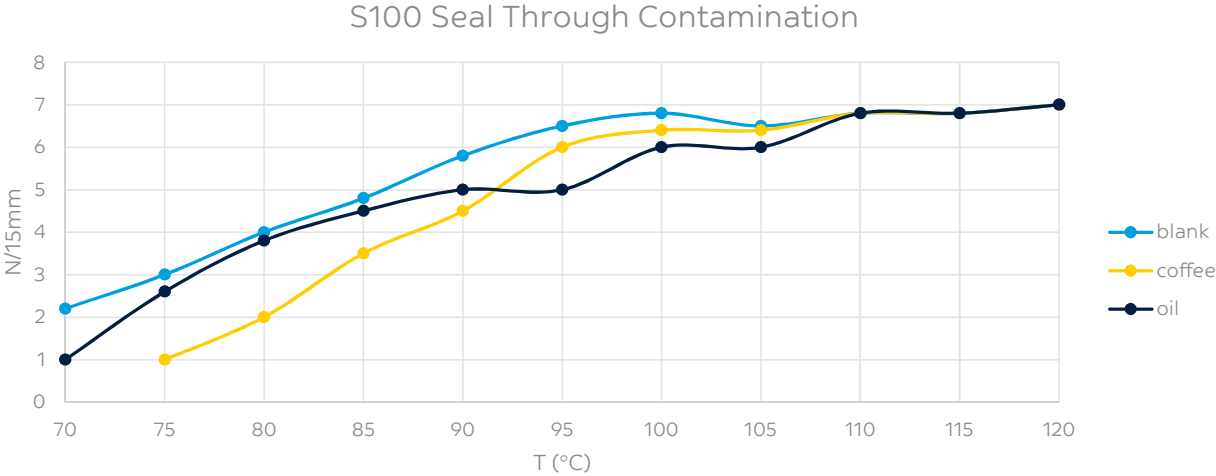


**COHERE™ S100 can increase the  $\Delta T$  between outer and sealing layer which is critical for sealing in mono PE-material PE solutions**



# FOOD PROTECTION WITH ENHANCED SEALING

## COHERE™ S100 for SEALING THROUGH CONTAMINATION



- Mono layer 30µ film  
100% COHERE™ S100
- Contaminants applied on seal area of film:  
coffee powder and edible oil
- Test sealing

➤ Contamination do not affect max seal strength of COHERE™ S100

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# PVC FREE CLING FILM

## DESIGN FOR RECYCLABILITY: PVC FREE



### OVERALL TREND TO MOVE TO EASIER RECYCLABLE FILM STRUCTURES

- Greater awareness of sustainability issues among Brand Owners, retailers and customers
- Government legislation & regulation

PVC is a contaminant to the recycling process and PVC based cling film should be replaced by the end of 2021.

UK PLASTICS PACT –  
2<sup>nd</sup> wave of plastic packaging items to be avoided

Avoid the use of PVC where viable technical alternative exist.

METRO GROUP – Packaging Policy

Tesco will remove packaging that is hard to recycle - including PVC in plastic film.

TESCO – announcement May 23th, 2018

## PVC FREE CLING FILM

### SABIC's mono PE cling film solution enables **USE IN ALL FOOD APPLICATIONS**



#### REDUCING RISK & COMPLEXITY

- at brand owners & retailers



#### CONVENIENCE & SIMPLIFICATION

- one formulation for all type of food products

**POTENTIAL FOOD APPLICATIONS:**  
vegetables, fruits, meat,  
fatty food (soft cheese, oily food)



# MONO-PE CLING FILM

## VALIDATION TESTS

with SABIC's PE cling film solution



PE CLING FILM REFERENCE

10 µm



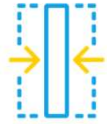
SABIC PE CLING FILM

10 µm



### MACHINABILITY

- smooth processing
- machinability



### ADHESION

- to assure food integrity



### OPTICS

- haze and gloss

➤ SABIC's full PE cling film meets all market requirements.

# CONCLUSIONS

# SUCCESSFUL MONO-PE INTRODUCTIONS

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## FROZEN FOOD PACKAGING

Down gauging up to 50%



## MONO-PE STAND-UP POUCH

Avoid multi-layer lamination structures



## PVC FREE CLING FILM

SABIC's mono-PE cling film solution enables use in all food applications

## FLEXIBLE FOOD PACKAGING

SABIC IS COMMITTED TO PACKAGING INDUSTRY WITH DEDICATED TEAMS AND TECHNOLOGY CENTERS TO COLLABORATE WITH OUR CUSTOMERS.





## POLL QUESTION 3

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How would you rate our webinar on a scale of 1-5 ?  
(5: is very good)

# QUESTIONS

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## Q&A SESSION

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**Attilio Scala**  
Sr. Manager  
Market Development &  
Technical Support - packaging



**Lucio Baccaro**  
Engineer  
Market Development &  
Technical Support



**Bart Vanhoof**  
Global Marketing Manager  
Flexible Packaging &  
TRUCIRCLE™ solutions

# WE WANT TO HEAR FROM YOU

**CONTACT US**  
[www.sabic.com/en/contact](http://www.sabic.com/en/contact)

**YOUR QUERY**

\* What would you like to ask about?  
Products

Which product does your enquiry relate to?  
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**WHICH PRODUCT DOES YOUR ENQUIRY RELATE TO?**

\* Which product area would you like to ask about?  
Polymers

\* Product family  
Polyethylene (PE)

\* Product  
---

Product application




\* What is the nature of your enquiry?  
Technical



**YOUR MESSAGE**

\* Subject

Message

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