



# New high performance Exact™ Plastomers

Energy lives here™

ExxonMobil





Agenda

Market & applications

New product offerings

Differentiated performance

Working together

ExxonMobil

# 塑性體是現今軟質包裝市場的關鍵

- 經濟趨勢帶動強勁的軟包裝需求

- ↳ 中產階級的人口增加
- ↳ 對於便利性&個人化的需求
- ↳ 小吃與電商銷售的增加
- ↳ 對於持續性包裝的需求增加

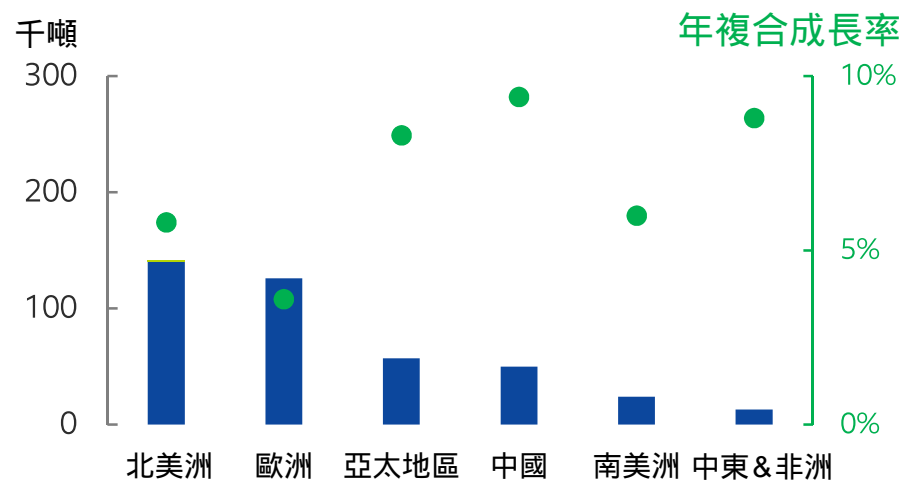
- 塑性體展現的良好的物性深受包裝商喜愛

- ↳ 低密封起始溫度和熱黏性可幫助快速包裝
- ↳ 絕佳的韌性、抗裂性和氣密性可提高食品安全性

- 全球擁有高達6%的強勁年複合成長率

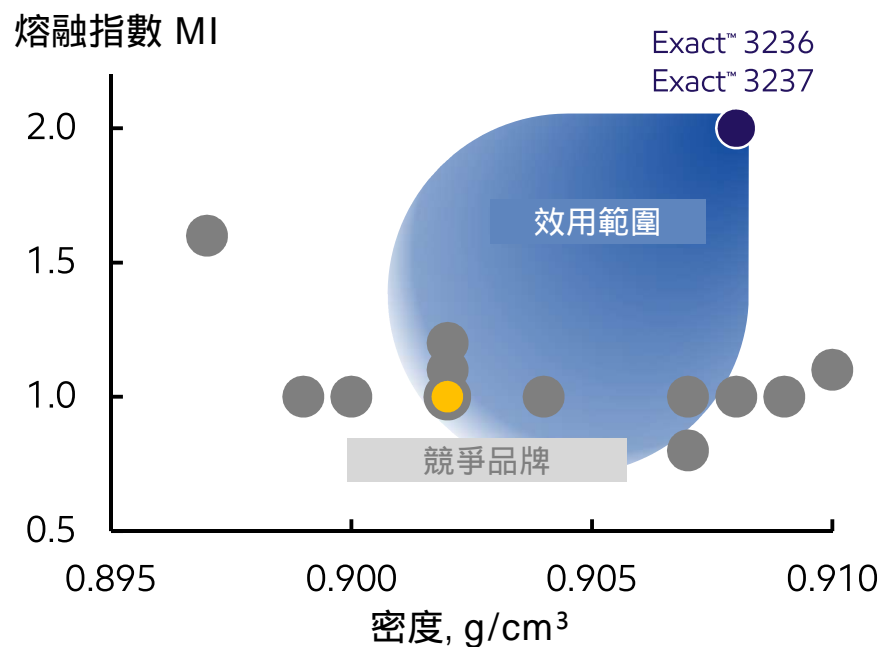
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410 千噸的薄膜塑性體需求-2019年



Sources: 2018 TOWNSEND, 2018 BCC, 2014 CMR, and EM estimates

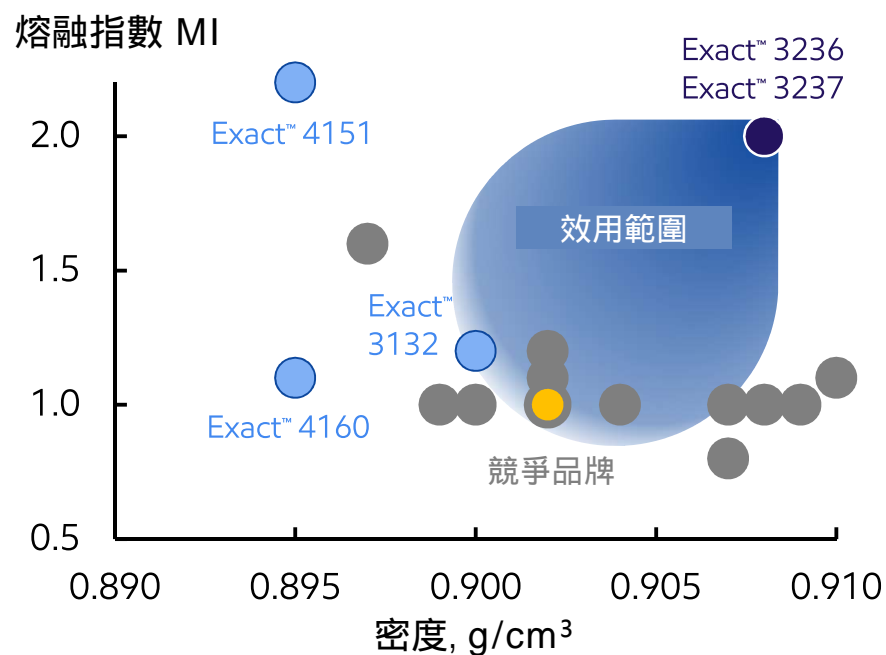
## EXACT 塑性體新牌號可提供更好的韌性 &amp; 密封性能



- Exact™ 3236 具有多種優良性能
  - ↳ 己烯共聚單體可提高強度
  - ↳ 2 MI 易於押出加工及填縫
  - ↳ 0.908 g/cm<sup>3</sup> 高密度可提高韌性
  - ↳ 與 0.902 g/cm<sup>3</sup> 塑性體相比擁有更好的密封性
  - ↳ 健全的加工助劑和熱穩定劑
- Exact™ 3237 採用相同的樹脂基底
  - ↳ 添加 1,000 ppm 滑劑及 5,000 ppm 開口劑以降低摩擦係數



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## EXACT 3236 的性能可應用在多種市場



- 更好的密封性能確保固態/液態食品包裝的完整性
- 更好的韌性及強度能降低包裝運輸時的損傷
- 低密封起始溫度和高熱黏性可應用在食品袋的快速包裝



- 站立包需要極佳的密封性
- 聚乙烯包裝需要低密封起始溫度以打開製袋口  
和更佳的韌性、強度以更好地匹配複合材料包裝

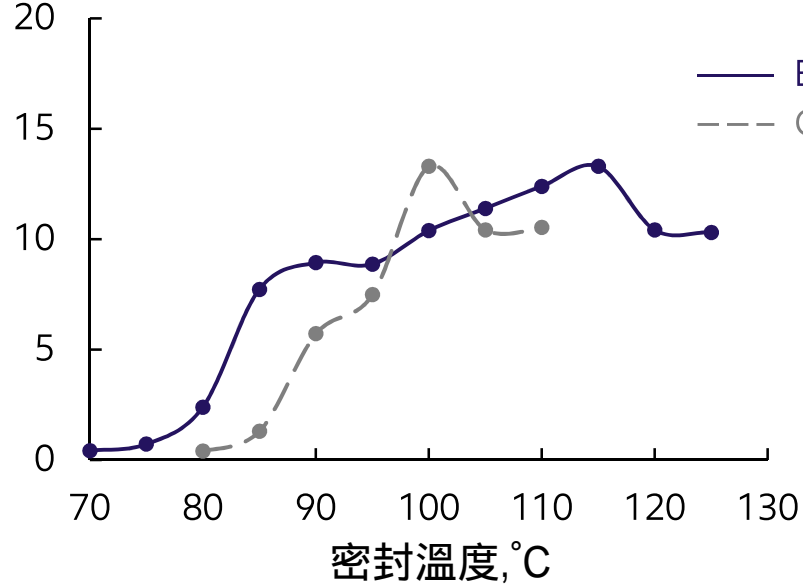
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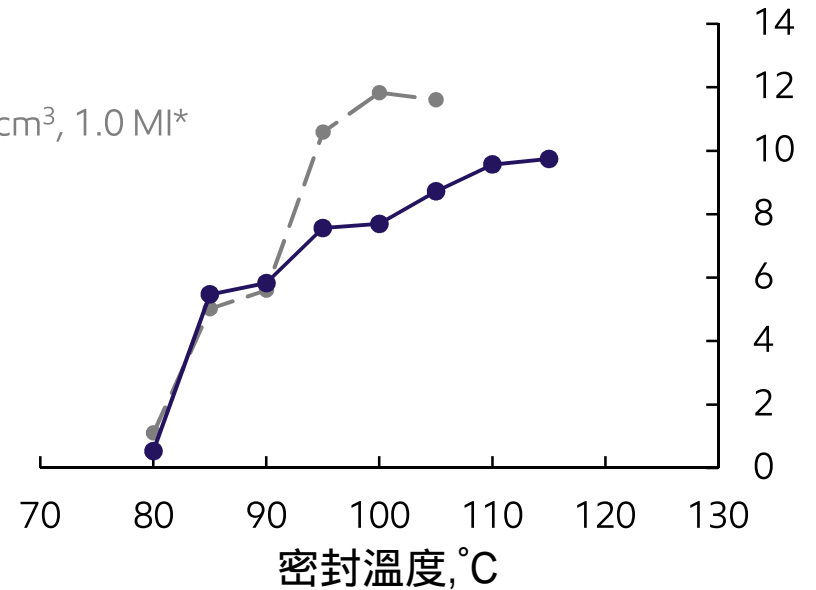
# EXACT 3236 在單層膜上有良好的密封性

薄膜結構：25.4微米單層膜

熱黏性 (N) (在25.4毫米的寬度):h

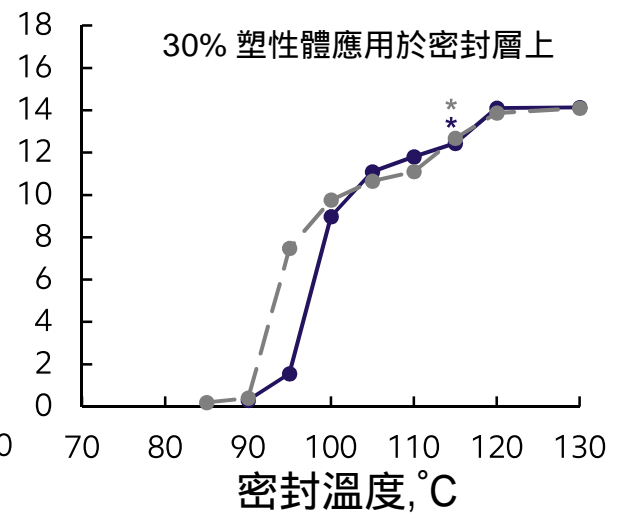
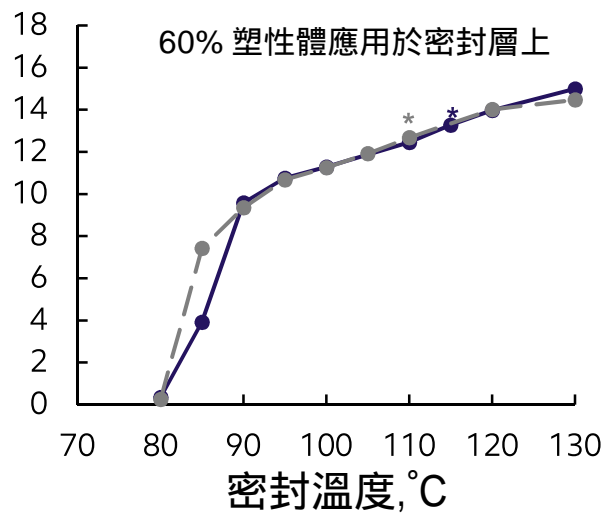
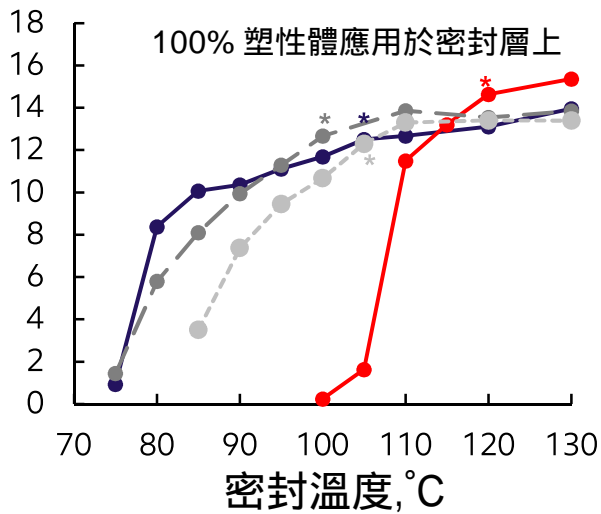


熱封力 (N) (在25.4毫米的寬度)



# EXACT 3236 在非層壓塑料的共擠押出有良好的密封性

熱封力 (N) (在15毫米的寬度)



\* Peel to break transition point in seal test

所有配方裡的  
MI單位為克/10分鐘  
密度單位為克/立方公分



- Exact 3236
- - - C8, 0.902 g/cm<sup>3</sup>, 1.0 MI
- ..... C8, 0.908 g/cm<sup>3</sup>, 0.85 MI
- Exceed 1018

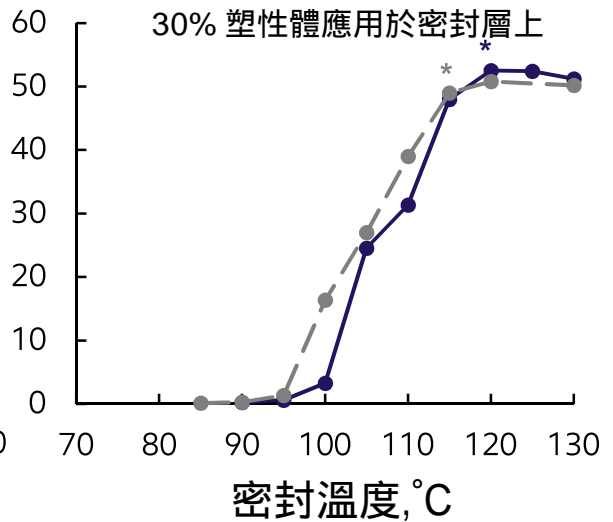
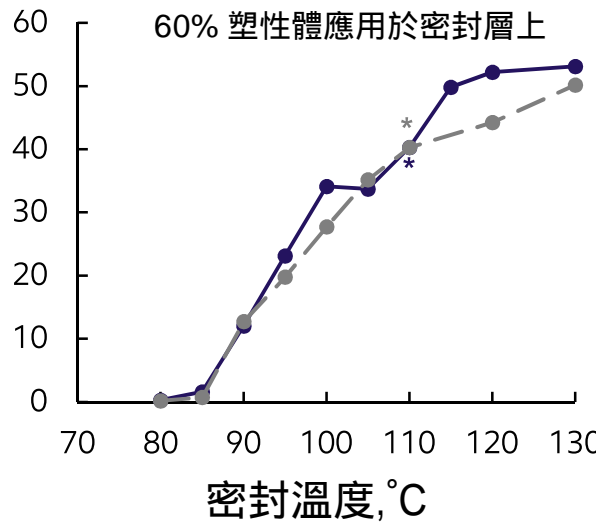
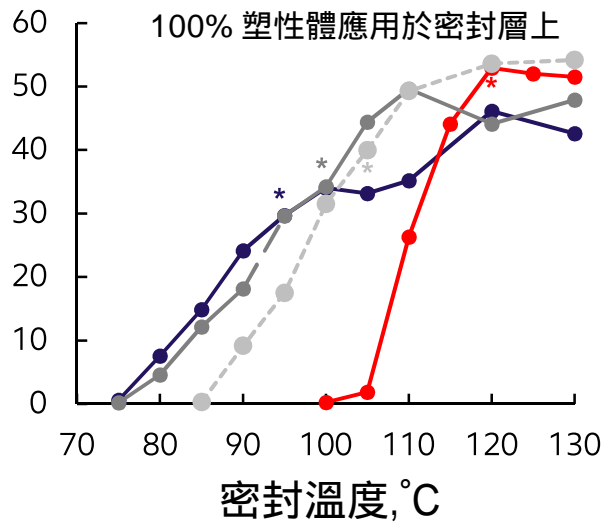
塑性體共擠押出結構 , 50 μm, 1/2/1	
內層	75% Exceed™ 1018 + 25% Enable™ 2005
中間層core	83% Enable™ 2005 + 17% HDPE (0.961d, 0.7 MI)
密封層	100%, 60% or 30% 塑性體配方, 以及 Exceed™ 1018

Exact™ plastomer resins. Data from tests performed by or on behalf of ExxonMobil



# EXACT 3236 在層壓塑料的共擠押出有良好的密封性

熱封力 (N) (在15毫米的寬度)



\* Peel to break transition point in seal test

- Exact 3236
- - - C8, 0.902 g/cm<sup>3</sup>, 1.0 MI
- · · C8, 0.908 g/cm<sup>3</sup>, 0.85 MI
- Exceed 1018

以12微米 PET進行層壓

塑性體共擠押出結構, 50 μm, 1/2/1	
內層 i	75% Exceed™ 1018 + 25% Enable™ 2005
中間層 core	83% Enable™ 2005 + 17% HDPE (0.961d, 0.7 MI)
密封層	100%, 60% or 30% 塑性體配方, 以及 Exceed™ 1018

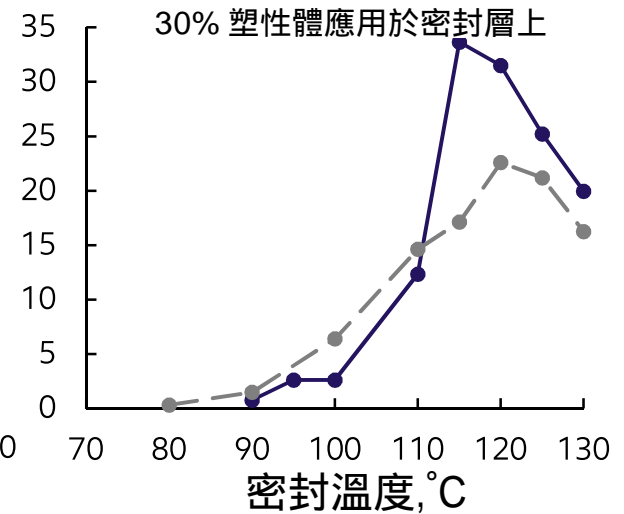
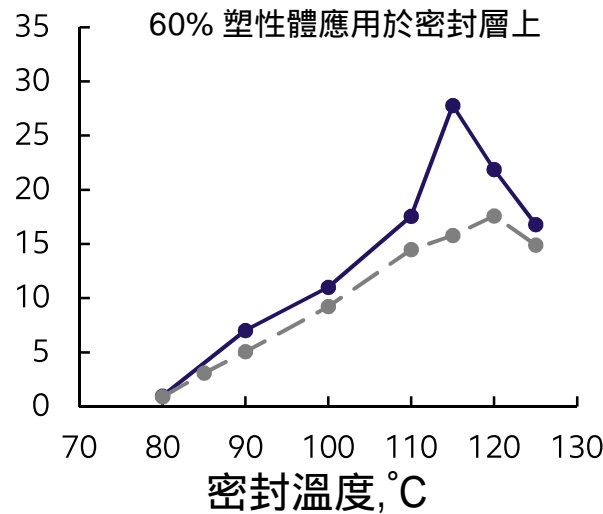
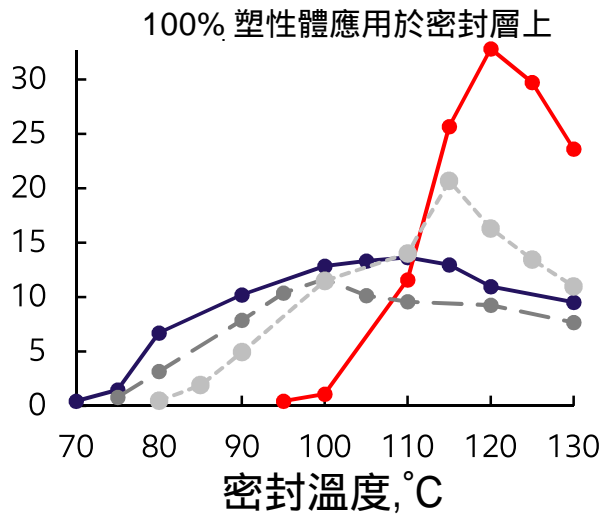


Exact™ plastomer resins. Data from tests performed by or on behalf of ExxonMobil

# EXACT 3236 在層壓塑料的共擠押出有良好的密封性

熱黏性 (N) (在30毫米的寬度)

\*在 28N 以上，封口於熱黏性測試上未打開



以12微米 PET進行層壓

- Exact 3236
- - - C8, 0.902 g/cm<sup>3</sup>, 1.0 MI
- ..... C8, 0.908 g/cm<sup>3</sup>, 0.85 MI
- Exceed 1018

塑性體共擠押出結構 , 50 μm, 1/2/1	
內層	75% Exceed™ 1018 + 25% Enable™ 2005
中間層core	83% Enable™ 2005 + 17% HDPE (0.961d, 0.7 MI)
密封層	100%, 60% or 30% 塑性體配方, 以及 Exceed™ 1018

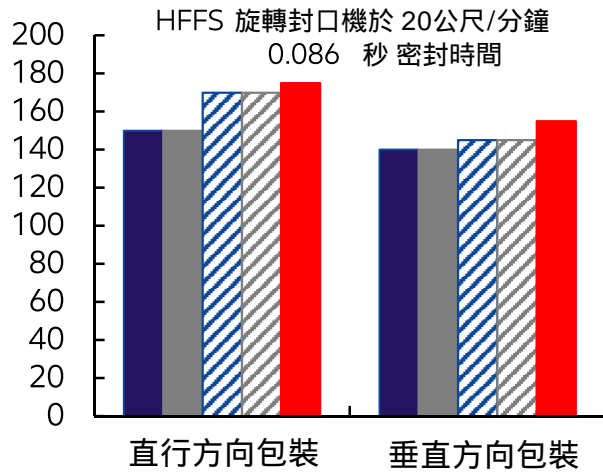


Exact™ plastomer resins. Data from tests performed by or on behalf of ExxonMobil

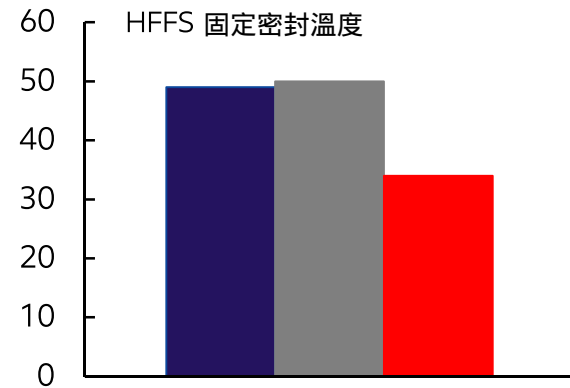


# EXACT 3236 在臥式填充生產線上的流暢包裝

固定生產速度下  
所需的密封溫度(°C)



固定密封溫度下  
能達到的最高生產速度(公尺/分鐘)



以12微米 PET進行層壓

塑性體共擠押出結構, 50µm, 1/2/1

內層	75% Exceed™ 1018 + 25% Enable™ 2005
中間層core	83% Enable™ 2005 + 17% HDPE (0.961d, 0.7 MI)
密封層	100% or 30% 塑性體配方, 以及 Exceed™ 1018

Exact 3236 在臥式填充  
生產線上可流暢包裝

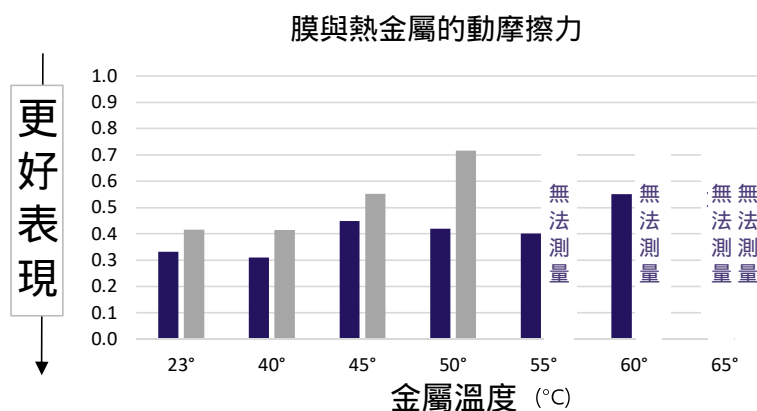
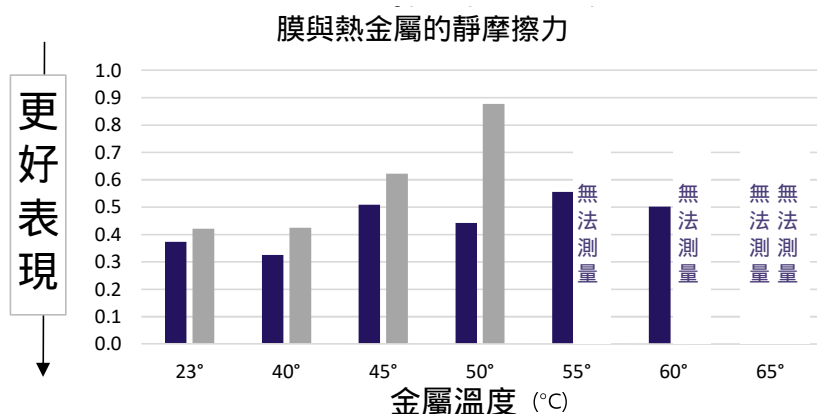
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- Exact 3236
- C8, 0.902 g/cm<sup>3</sup>, 1.0 MI
- 30% Exact 3236
- 30% C8, 0.902 g/cm<sup>3</sup>, 1.0 MI
- Exceed 1018

Exact™ plastomer resins. Data from tests performed by or on behalf of ExxonMobil. Packaging line data (seal temp. and max line speed) are generated by ExxonMobil at third party, and should only be used as comparative data

# 可加工性

Exact™ 3236 在接觸生產線熱表面時可以提供更好的滑度



	C8 塑膠體基底 對照組 50µm, 1/2/1	Exact™ 3236 50µm, 1/2/1
內層	75% Exceed™ 1018 + 25% Enable™ 2005	
中間層core	81% Enable™ 2005 + 17% HDPE (0.961d, 0.7 MI) + 2%滑劑 MB	
密封層	C8 塑膠體基底 對照組 (0.902d, 1 MI) + 1%滑劑 MB + 1,5% 開口劑 MB	Exact™ 3236 (0.908d, 2 MI) + 1%滑劑 MB + 1,5% 開口劑 MB

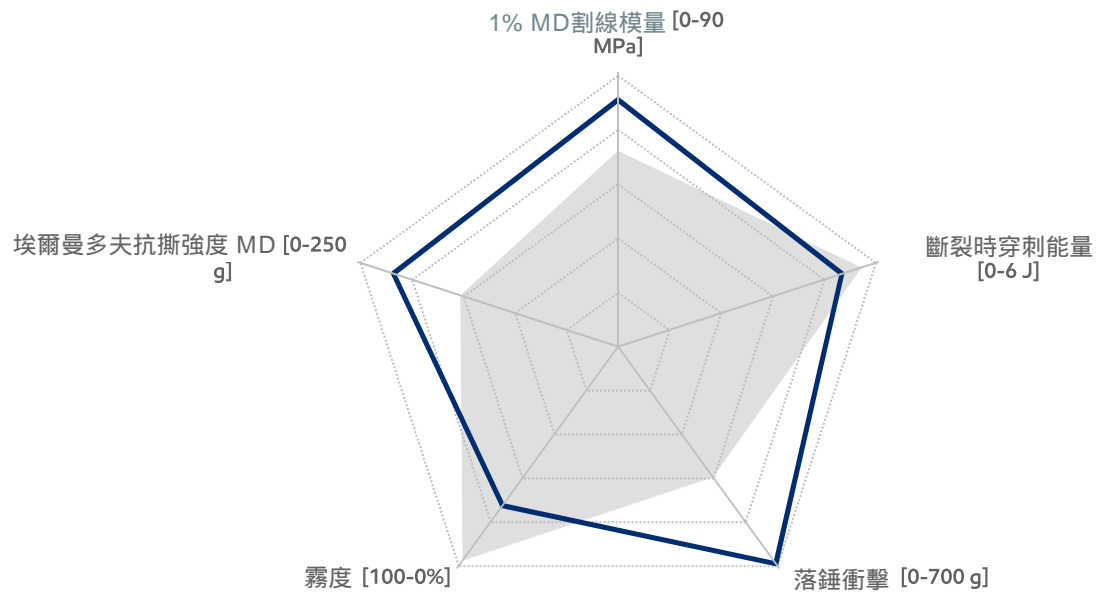
膜與膜摩擦係數

	C8 塑膠體 對照組	Exact™ 3236
膜與膜的靜摩擦係數	0.29	0.20
膜與膜的動摩擦係數	0.21	0.16

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Exact™ plastomer resins. Data from tests performed by or on behalf of ExxonMobil. COF film – metal should only be used as comparative data

# 於單層膜上的機械及光學性能



## Exact™ 3236

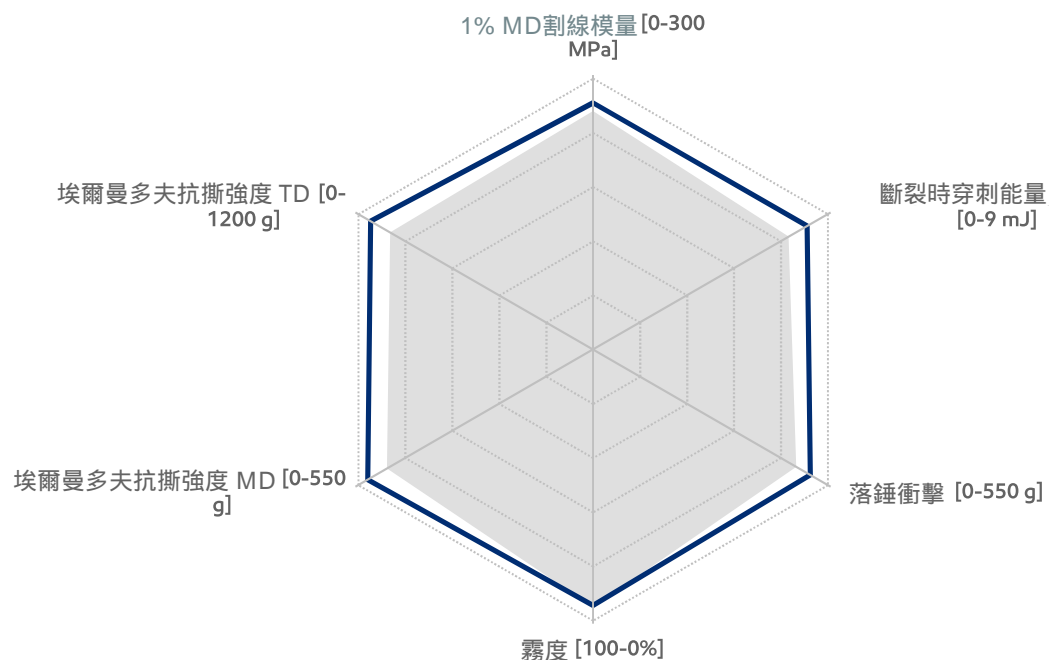
- 相比起C8 塑性體 (0.902d, MI=1) 能更好地提高單層膜的韌性及強度。

— Exact™ 3236

— C8, 0.902 g/cm<sup>3</sup>, 1.0 MI

薄膜結構：25.4微米單層膜

# 於共擠押出的機械性能及光學性能



## Exact™ 3236

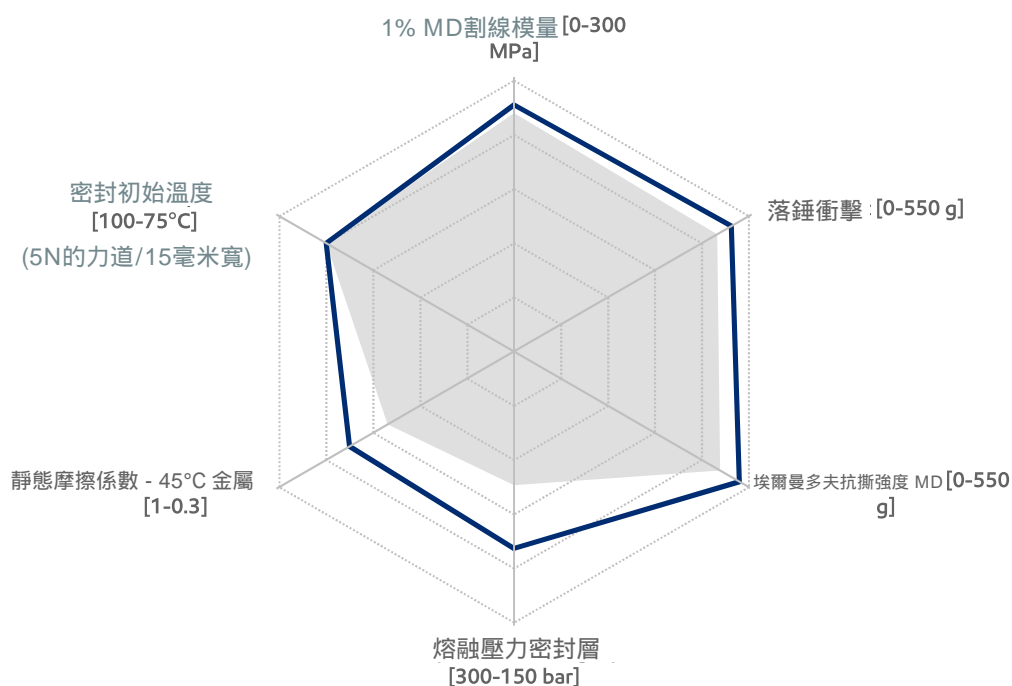
- 於共擠押出的機械性能及光學性能比較 (Exact 3236/C8塑性體 配方比較)

	C8 塑性體基底 對照組 50 μm (微米)	Exact™ 3236 基底的配方 50 μm (微米)
比例	1 / 2 / 1	1 / 2 / 1
外層	75% Exceed 1018 + 25% Enable 2005	75% Exceed 1018 + 25% Enable 2005
中間層core	83% Enable 2005 + 17% HDPE (0.961d, 0.7 MI)	83% Enable 2005 + 17% HDPE (0.961d, 0.7 MI)
內層	C8 (0.902d, 1.0 MI)	Exact 3236

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Exact™ plastomer resins. Data from tests performed by or on behalf of ExxonMobil

# Exact 3236 可以怎麼幫助你



添加 Exact 3236 比較  
Exact™ 3236 添加C8塑性體對照組(0.902 d, 1.0 MI)

- 可供比較的密封/包裝性能
- 提升押出性能
- 提升韌性及強度
- 提升在熱表面的加工性能

Exact™ 3237

- 上述所有性能 添加滑劑及開口劑

**C8 塑性體基底 對照組**  
50 μm (微米)

**Exact™ 3236 為基底的配方**  
50 μm (微米)

比例	1 / 2 / 1	1 / 2 / 1
外層	75% Exceed 1018 + 25% Enable 2005	75% Exceed 1018 + 25% Enable 2005
中間層core	83% Enable 2005 + 17% HDPE (0.961d, 0.7 MI)	83% Enable 2005 + 17% HDPE (0.961d, 0.7 MI)
內層	C8 (0.902d, 1.0 MI)	Exact 3236

\*在單層膜觀察到的性能提升  
若應用在共擠押出會稍微降低物性

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COF film – metal should only be used as comparative data



# Working together

## 定義我們的下一步



- 什麼利益和潛在價值能驅動這個專案？
- 你該聚焦在你商業活動裡的哪一部分？
- 現今最重視何種薄膜的特性/關鍵特性的最終用途是什麼？
- 開始專案前還需要甚麼其他資訊？
- 任何來自發展團隊的協助需求？

## 價值鏈的合作關係



加工過程



品牌商



包裝商



零售通路



消費者

催化劑研究

Catalyst  
research

Process  
technology

加工技術

Value creation

實際應用

Application  
expertise



Creating  
differentiated  
solutions.  
Together.

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# 測試方法

測試項目	檢驗方法
熔融指數 MI	埃克森美孚方法搭配 ASTM D-1238 及 供應商數據
密度	埃克森美孚方法搭配 ASTM D-4703 及 ASTM D-1505 及 供應商數據
TREF	埃克森美孚方法
落錘衝擊測試 (自由落錘)	埃克森美孚方法搭配 ASTM D-1709
埃爾曼多夫抗撕強度	ASTM D1922-15
薄膜上拉伸性能	埃克森美孚方法搭配 ASTM D-882-18
穿刺 (針)	埃克森美孚方法搭配 ISO CEN 14477-04
穿刺	埃克森美孚方法
熱封力	埃克森美孚方法搭配 ASTM F-88-15
熱黏力	埃克森美孚方法搭配 ASTM D-1921-12
膜與膜 摩擦係數	ASTM D1894
膜與金屬 摩擦係數	埃克森美孚方法
生產線數據資料	埃克森美孚方法

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