Practical Methods to Manufacture

Sustainable Plastics Products

I. Partial Foaming

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Introduction

- Sustainability is a crucial word to follow for plastics industry.
- A very general, yet precise, explanation of Sustainability would be producing a product with using the least amount of resources.
- Foamed plastics have been in the market for long time. Its traditionally used for insulation products if it is fully foamed.
- You can foam your product fully or partially. Our main focus today is **PARTIAL FOAMING** where you foam your product "just a bit" to make your product more sustainable and there come all other advantages with it.

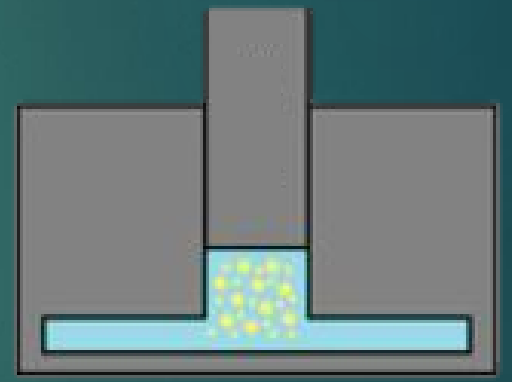
Towards Sustainability via Foaming

- Overcome your process issues and Improve your products properties

Some of the benefits of partially foaming your product:

- Increase shot speed,
- Reduce cycle time,
- Improve impact resistance
- Lower part stress and warpage
- Increase dimensional stability
- Remove sink marks

<u>All of which translates to less rejected parts and higher efficiency</u>



A typical Partial Foaming

Towards Sustainability via Foaming

➢ Save $$$

Without sacrificing key properties of your product, you can reduce the weight of your products up to 10 to 30% (depending on the application).

Then where you save:

- As a rule of thumb, by reducing 5% of the weight, you pay for the additives, the rest is the money back in your pocket,
- You use less energy to process the same product

  ($ back in your pocket).

Towards Sustainability via Foaming

- Save $ for your Client

Where your clients save:

- Obviously part of the cost-saving can be passed to your clients,
- Transport will be easier and less expensive,
- In case installation and handling is required, your client saves on that as well , easier handling.

Towards Sustainability via Foaming

- Reduce the Direct Impact on the Environment

  - **Less Material and Energy used to produce the same product**

    >>> **LOWER CARBON FOOTPRINT**,

    e.g. Produciton of 1 lb of PET emits 1 to 5 lbs of CO_2 to the environment

    (Gironi F, Environmental Progress & Sustainable Energy, AICHE, 2011).

  - **Less energy used for transport,**

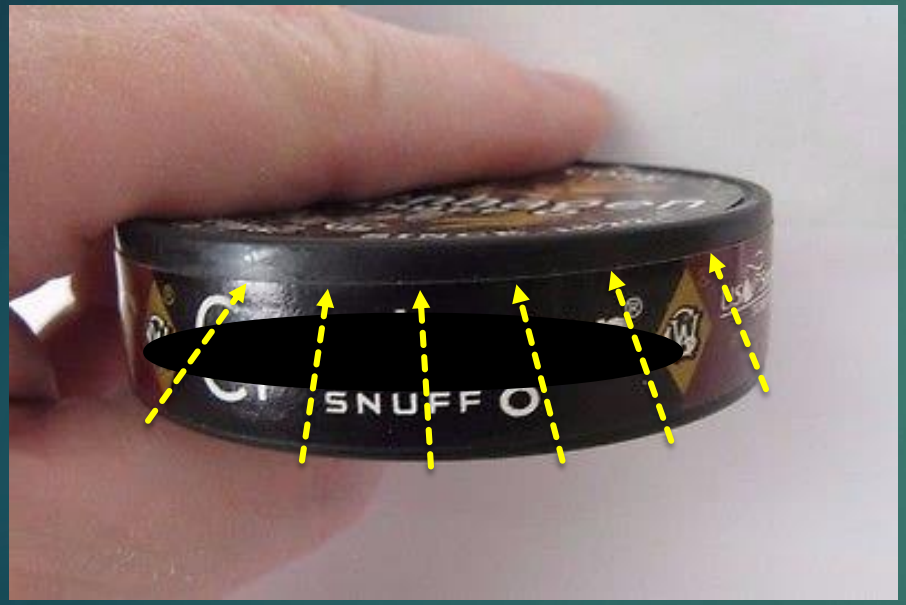
    (Weber & Matthews 2008 "Food-Miles and the Relative Climate)

Transport type	Lbs CO_2 per ton mile
Rail Freight	0.06
Ocean Shipping, Container	0.05
Air Freight	2.2

  - **Less waste produced after its end of life.**

Case Studies

Case Studies



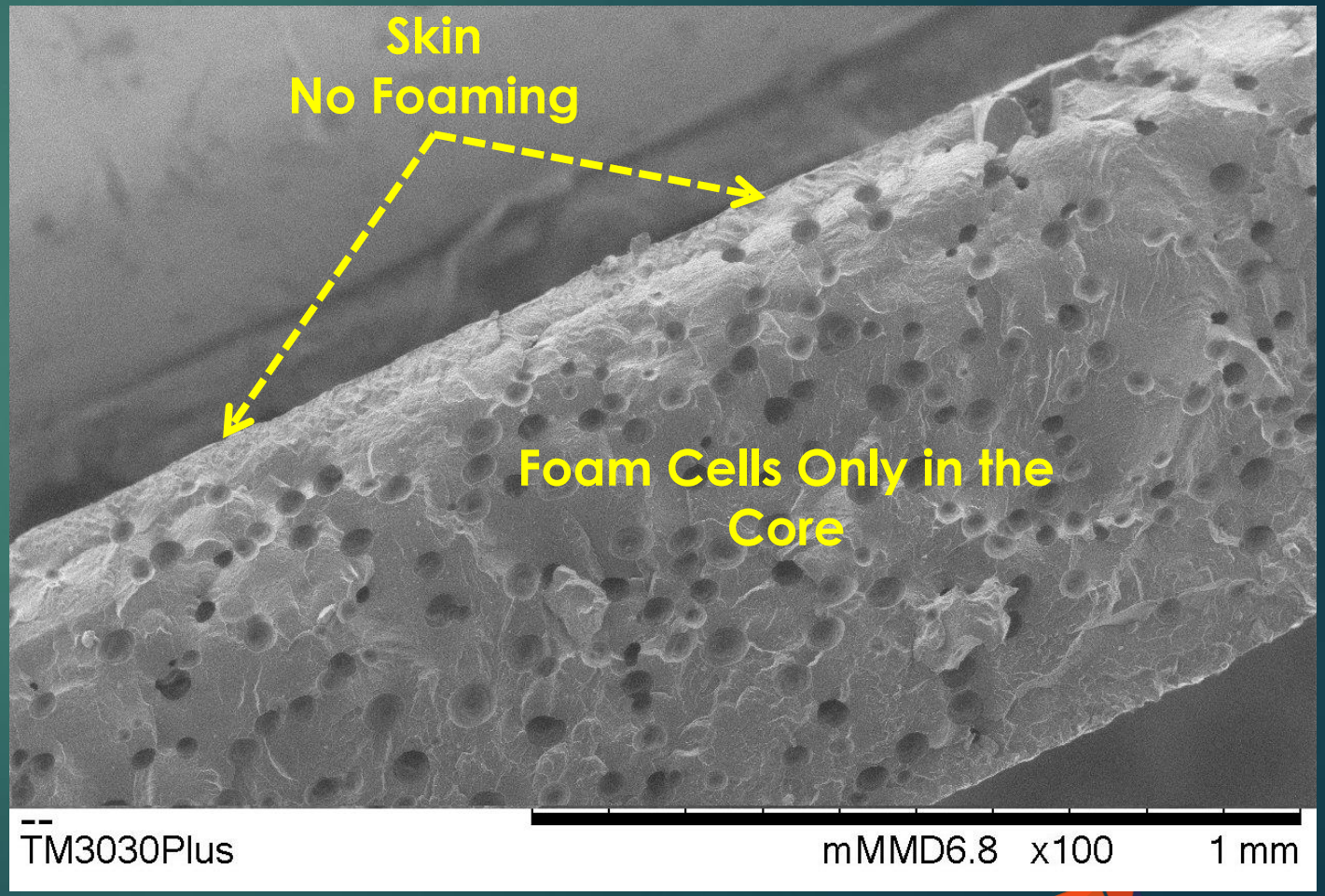
Product	Closure
Material	PE
Thickness , mil	25
Weight reduction via foaming, %	18%

Case Studies

Product	Toothpaste Cap
Material	PE
Process	Injection Molding
Thickness , mil	30
Weight reduction via foaming , %	14%

Case Studies

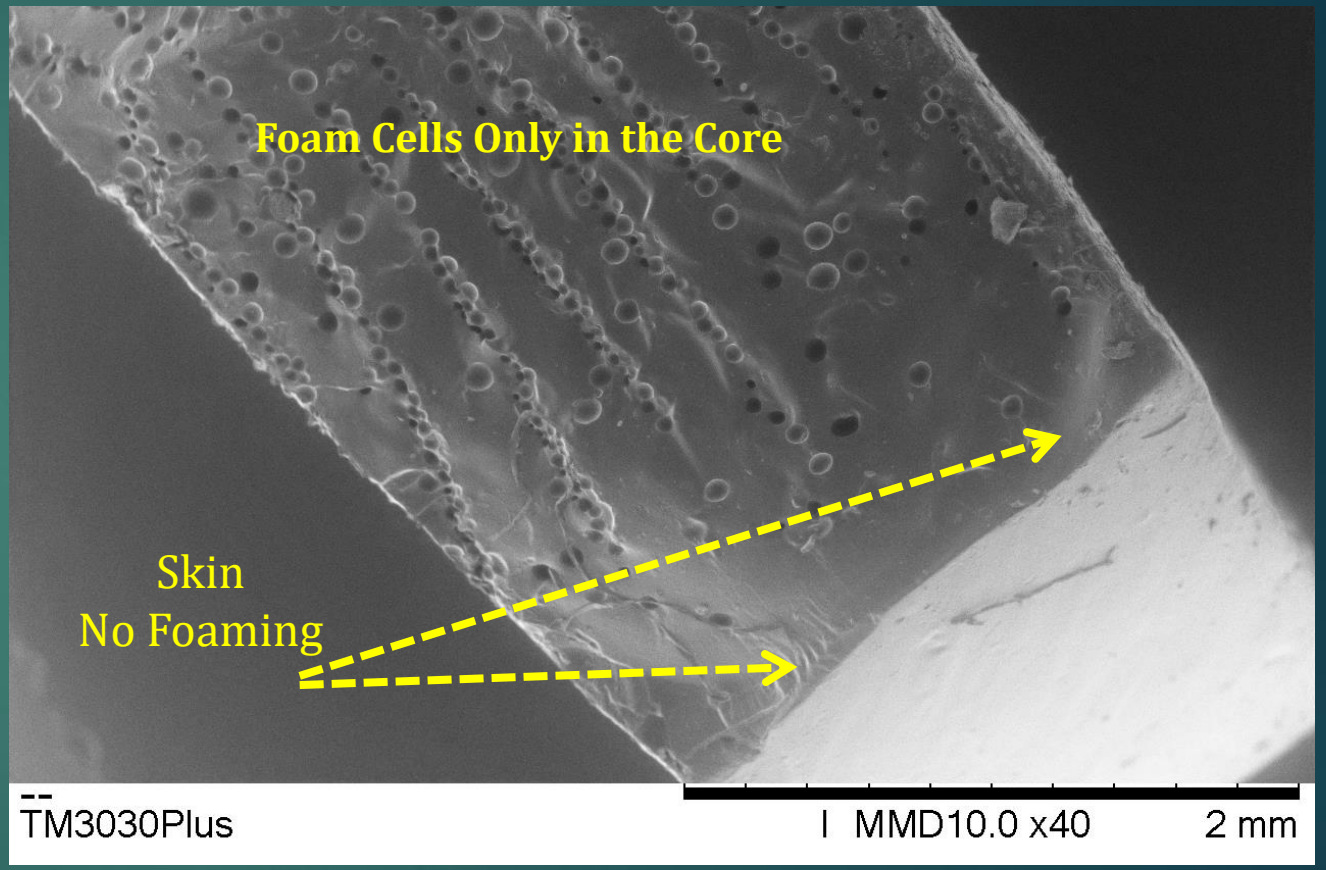
Material	GPPS
Process	Injection Molding
Thickness	75 mil
Weight Reduction	25%



Scanning Electron Microscopy Image

Case Studies

Material	PVA
Process	Injection Molding
Thickness	Ball type
Weight Reduction	35%



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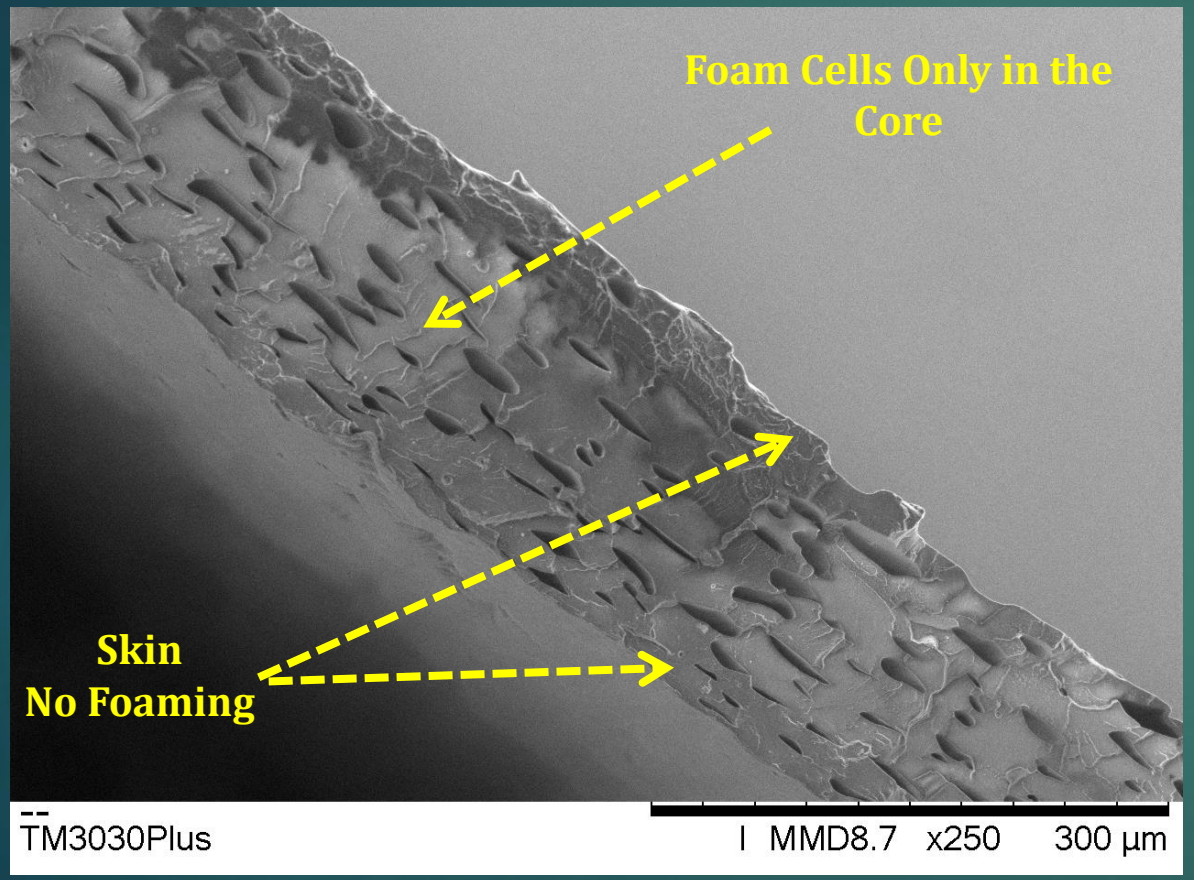
Case Studies



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Material	PE
Process	Blown Film
Thickness	7 mil 180µm
Weight Reduction	15%

Engineer Your Products via Partial Foaming &

Hit Multiple Targets by One Bullet!

Using Our Specifically Designed Foaming Systems for Partial Foaming You:

- Save on Material Cost
- Save on Transport Cost
- Maintain Your Part's Aesthetic and Physical-mechanical Properties
- Overcome Your Process Issues and Improve Your Products Properties.
- Provide More Sustainable Products by Using Less Plastic

Contact us to explore this opportunity for your product line:

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