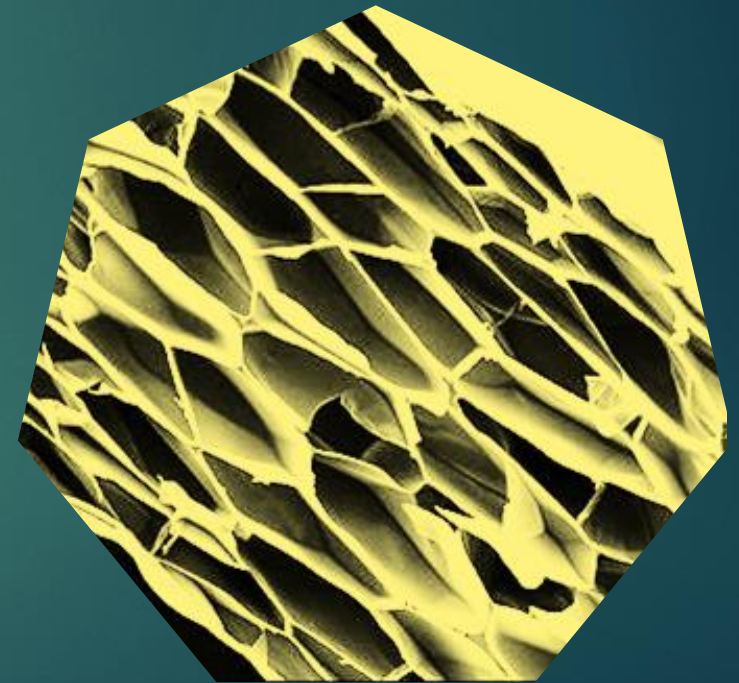# Why Partial Foaming can be your way to Engineer Your Products?!

Dr. A. ZAD

Dr. T. GARCIA

AxiPolymer

Your Partner in Product Development

Introduction

► Foamed plastics have been in the market for long time. Styrofoam is a great example of a fully foamed material with great performance.

► You can foam your product completely or partially. Our main focus today is **PARTIAL FOAMING** where you foam your product "just a bit" to overcome your process/product issues and bring some savings.

► In this article we will try to the provide reasons to explain why it worth thinking about **Partial Foaming** when you have process/product/cost issues.
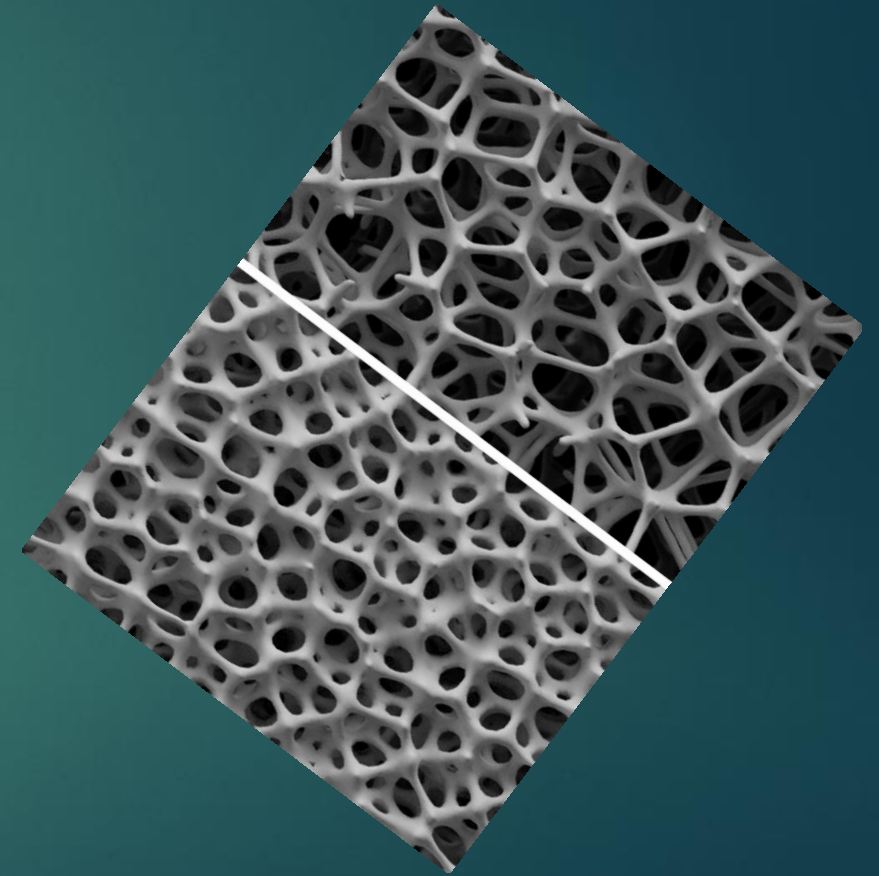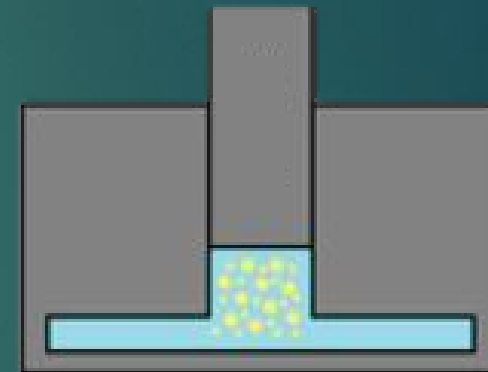
Why should I even think about foaming my product?

➢ **to 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

A typical Partial Foaming

Why should I even think about foaming my product?

➢ **to 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).

Why should I even think about foaming my product?

➢ **to 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.

Why should I even think about foaming my product?

➤ **to do your part in Saving the Environment for you Kids.**

↳ <u>**Less Material and Energy used to produce the same product**</u>

    >>> **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).

↳ <u>**Less energy used for transport,**</u>

(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

↳ <u>**Less waste produced after its end of life**</u>.

Myths about FOAMs & FOAMING

▶ Its not only in technical issues, its all over our lives that we make a rule based on a case happened to us or someone we know, without deeply analysing the reasons.

▶ Now lets see some of those myths about foaming your products.

Myth#1: *But foamed products are low quality ones!*

↳ **False!** If you use the right foaming agent specific for your product, and then adjust the rest of your process accordingly. BUT if you just want to blow some gas in your product then you will have real difficulty selling your product.

↳ A Performant <u>Partially Foamed Plastic Product,</u> is a great example of <u>AN ENGINEERED PRODUCT.</u>

Myth#2: *Alright, but my product cannot be foamed!*

e.g. its too thin or esthetic is important.

↳False! For some resins or designs you may be right, BUT these cases are way more limited than what you may think of.
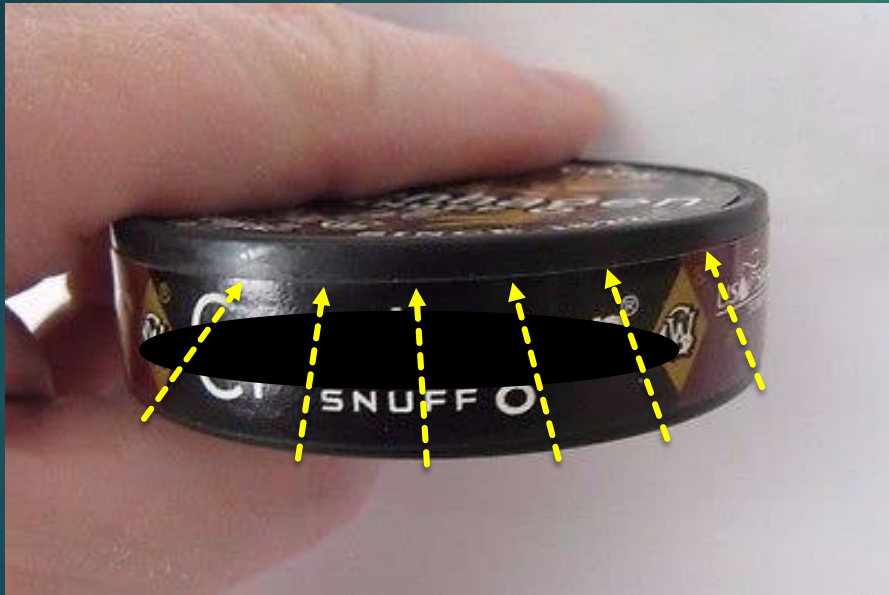
Note that:

Not in every foaming you should go up to 40-50 % weight reduction, sometimes 10% is enough for you to achieve your objective.

▶We provide some examples below for you to compare and find out what can be done.

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%

Conclusion

↪ **<u>Partial foaming</u> is one of the ways to <u>ENGINEER YOUR PRODUCTS</u> and to overcome some processing issues and save in many ways:**

1. Your cost,

2. You clients' cost,

3. Environmental issues

↪ **Parameters to consider for a successful foaming process:**

1. Product design and formulation,

2. Type of foaming agent,

3. Processing conditions.

Contact us to explore this opportunity for your product line:

info@axipolymer.com
www.axipolymer.com
Tel: (514) 839 4955
        (647) 491 7979

AxiPolymer

Your Partner in Product Development