



# What's in a Pellet

August 17, 2022



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# Meet the Speaker



Bill Rinehart  
Senior Application Development Engineer  
Nexeo Plastics

With over 38 years of plastics experience at Nexeo Plastics, Bill Rinehart has seen it and done it all. As senior application development engineer, his vast experience in plastic engineering, design, and manufacturing makes him a valuable resource to our customers. Bill is a member of the Nexeo Technical Resource team where he is responsible for specifying raw material and supporting customers as part of their development process. He is also on the Nexeo Plastics Risk Assessment Board and manages all analytical work. Previous roles within Nexeo Plastics include manager of technical service, manager of analytical service and manager of regulatory and compliance.

# About Us

50  
YEARS

Almost 50 years of leadership in  
plastics distribution



Headquartered in  
**The Woodlands, Texas**

9,300

products distributed into more than 60 countries

750  
global employees

60+

world-class global  
suppliers

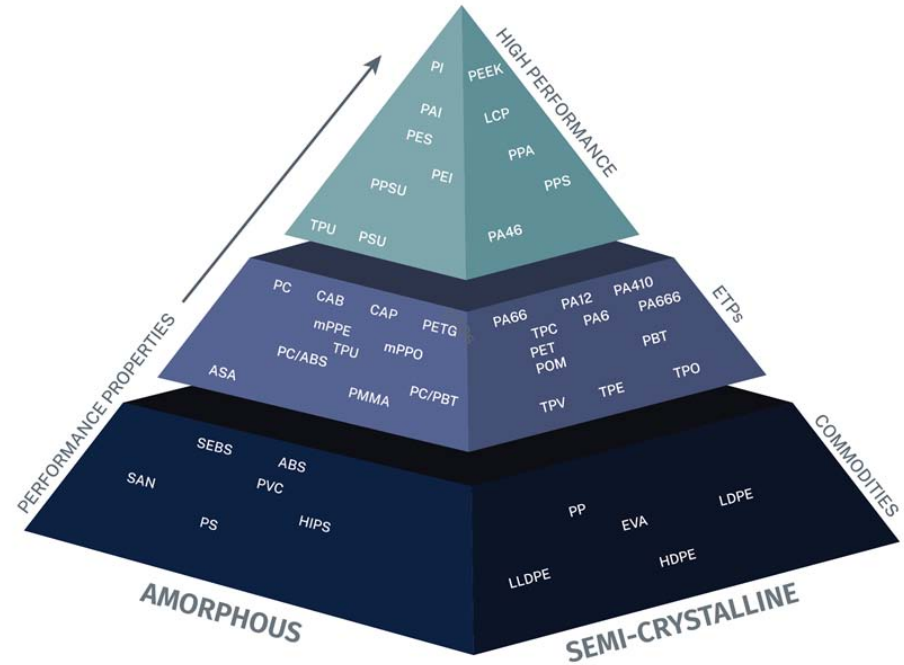
10,000

customers in industry segments such as  
automotive, compounding, healthcare,  
packaging, wire and cable, and more

Supply **nearly every grade** of prime  
thermoplastic resin for blow molding,  
extrusion, injection molding and rotational  
molding plastic processors

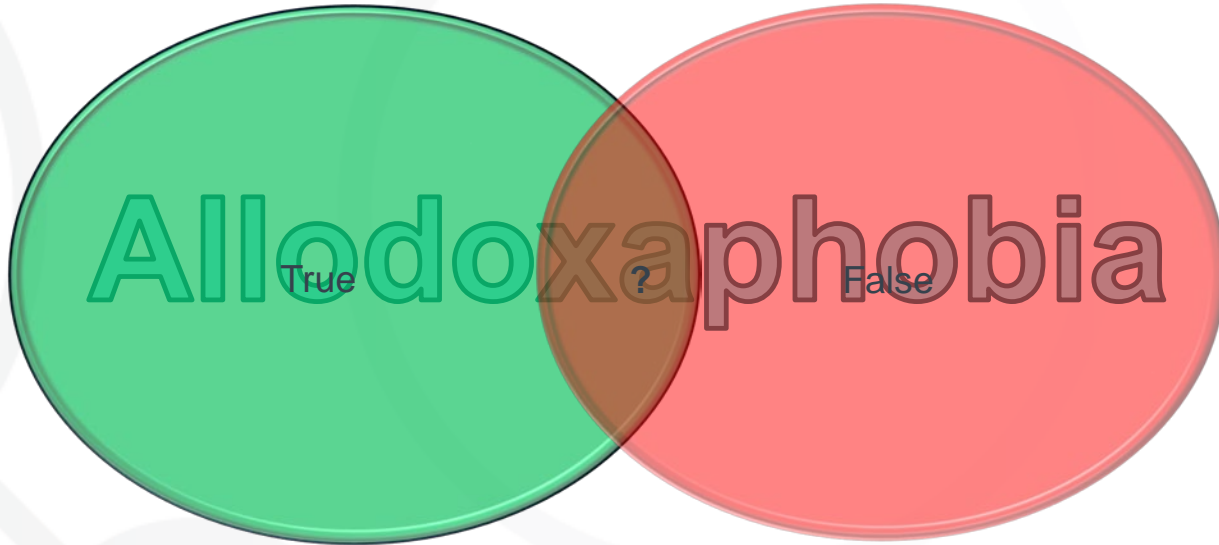
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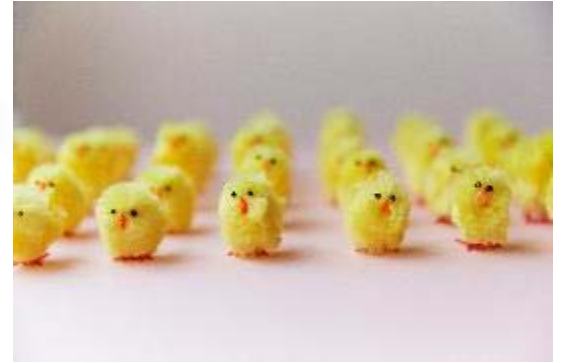
Material decisions  
What are we really looking at?



**I wanna go  
fast but at  
what cost?**







# What we want



# Information vs. Data vs. Facts

- In God we trust; all others bring data.
- Understanding variation is the key to success in quality and business.
- We are being ruined by the best efforts of people who are doing the wrong thing.

# Information vs. Data vs. Facts

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# DMA

- Modulus
  - What does it tell us?
  - What doesn't it tell us?



# Property Changes With Changes to Crystallinity By Mold Temperature

Change to only showing Flex modulus only as a property

Sample number	Material	Lot number	Flexural Modulus (Mpa)	Melt Temperature	Mold Temperature
1	Homopolymer PP	TXAC3C0471	1700	480°F	120°F
2	Homopolymer PP	TXAC3C0472	1640	480°F	110°F
3	Homopolymer PP	TXAC3C0473	1650	480°F	100°F
4	Homopolymer PP	TXAC3C0474	1290	480°F	90°F
Reported on Data sheet	Homopolymer PP	TXAC3C0475	1379	?	?
Limits	*	*	1372-1648	*	70°F - 120°F

# Understanding the Data

- Melt Flow Index
  - What does it tell us?
  - What doesn't it tell us?

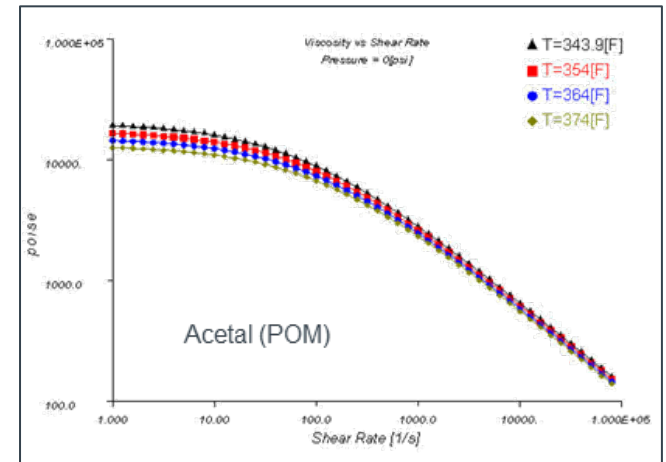
# The Value of Melt Flow Index

- **Melt Flow Index (MFI)**
  - Units: Grams/10min (is that viscosity?)
  - Uses static weights
  - Low shear rates
  - $MFI \uparrow = \text{Molecular Weight} \downarrow = \text{Viscosity} \downarrow$ 
    - 5melt PC has higher viscosity than 10melt PC
  - Primary use:
    - Incoming inspection
    - Lot-to-lot material changes
    - Evaluate relative MW
    - Comparing materials (?)



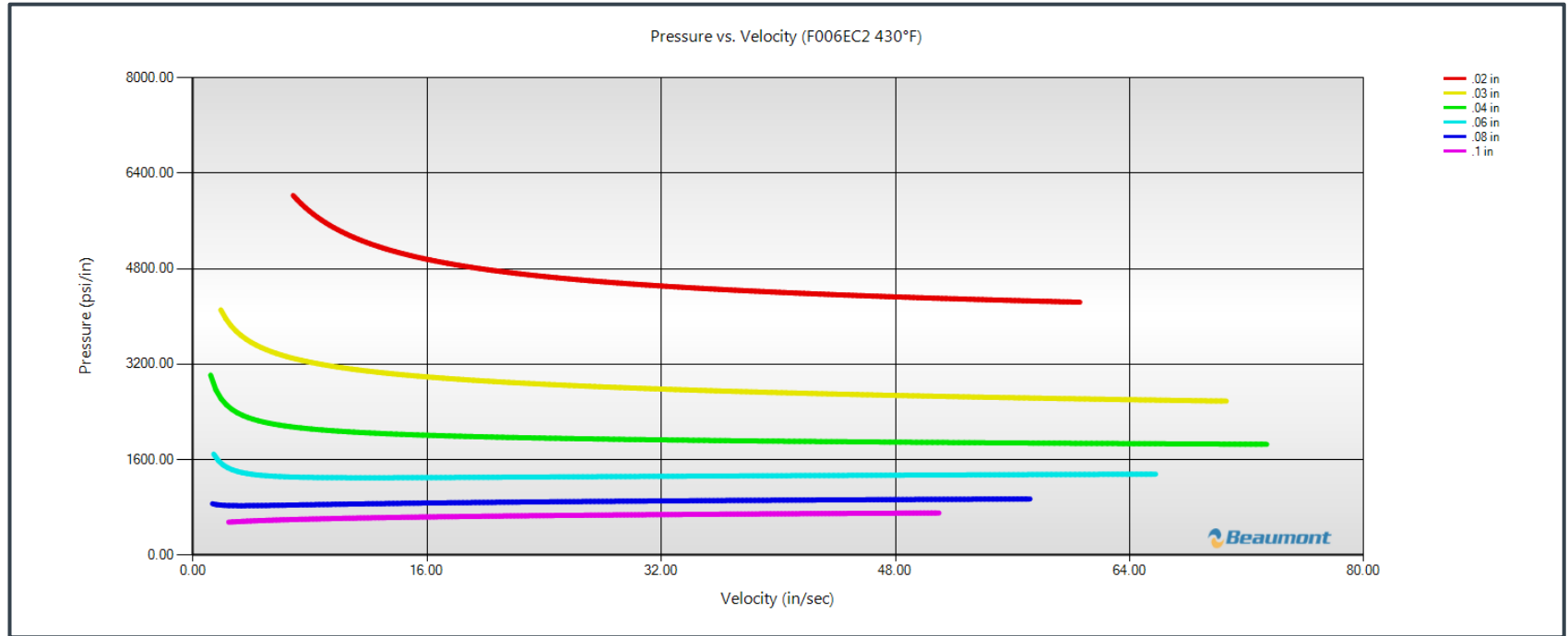
# Measuring Viscosity

- **Capillary Rheometer**
  - Units: Reciprocal seconds (1/s), Temperature, and Poise
  - Uses computer controlled drive systems
    - Ran at numerous shear rates
    - Ran at several temperatures
  - Primary use:
    - Flow simulation
    - Characterize material by generating shear rate vs. viscosity curves at various temperatures





# Velocity



# ThermaFlo Mold-Ometer

## Critical Velocity & Fill Pressure Index

Thickness (Inch)	Valox 430 PBT		Lexan 141		LDPE	
	Critical Velocity (inch/sec)	Pressure (psi/inch)	Critical Velocity (inch/sec)	Pressure (psi/inch)	Critical Velocity (inch/sec)	Pressure (psi/inch)
0.100	4.2	475	7.2	466	7.2	60
0.080	4.8	876	8	904	9.0	106
0.060	6	1,643	9	1,686	12	243
0.040	8	3,350	10.3	3,431	24	545

# Other Considerations

## Is the product a high volume product with the supplier

- MOQ vs the application

## Life cycle of material sustainability

- Is this a new product new technology
- Old product old technology and additives
- Last plant turn around

## Location of plants

- Single plant or multiple locations

## Substance management lists compliance

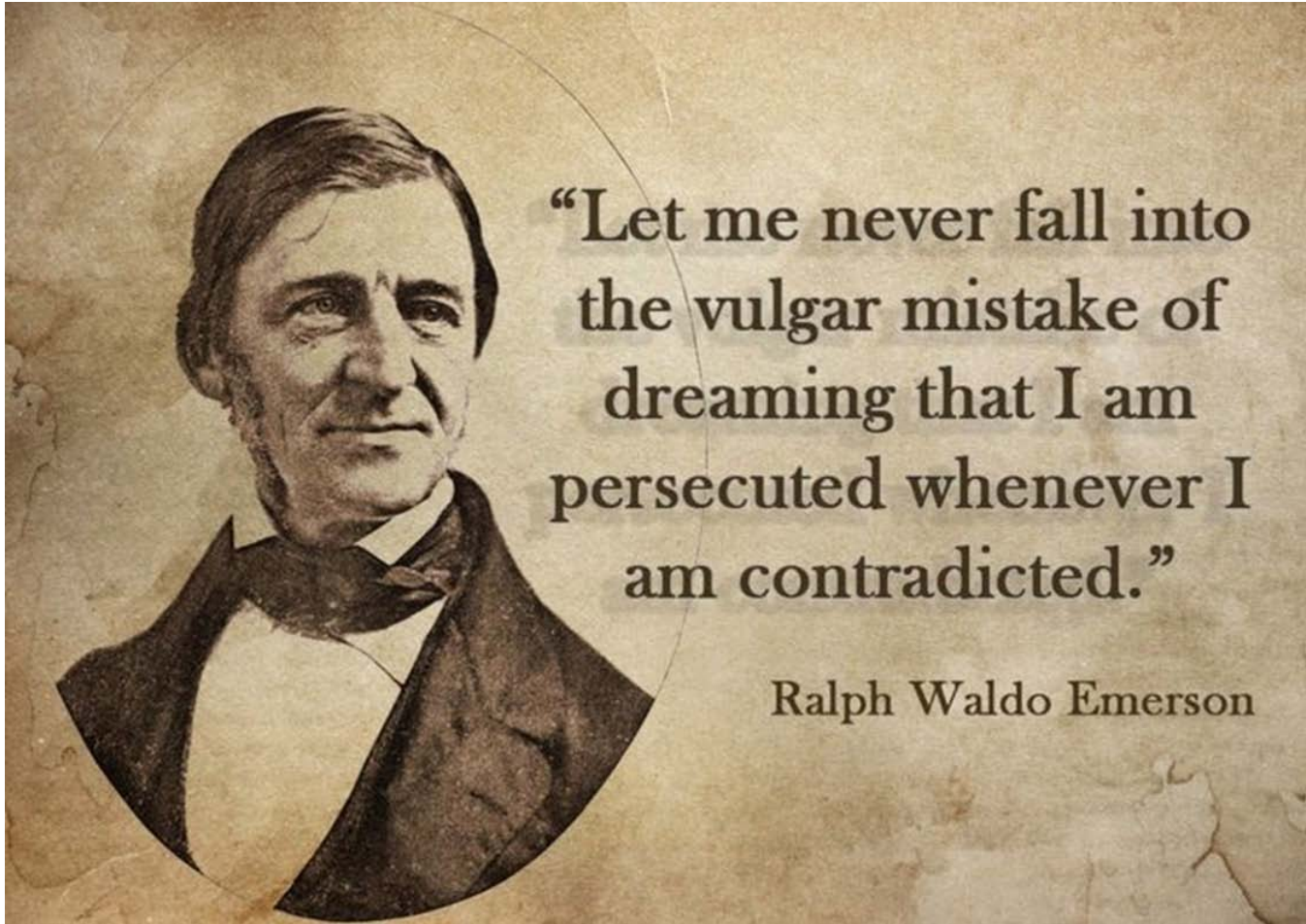
- Reach
- Rohs
- DSL NDSL .....

# What is in a Pellet?



# Our Suppliers





“Let me never fall into  
the vulgar mistake of  
dreaming that I am  
persecuted whenever I  
am contradicted.”

Ralph Waldo Emerson

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**Thank You**



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