

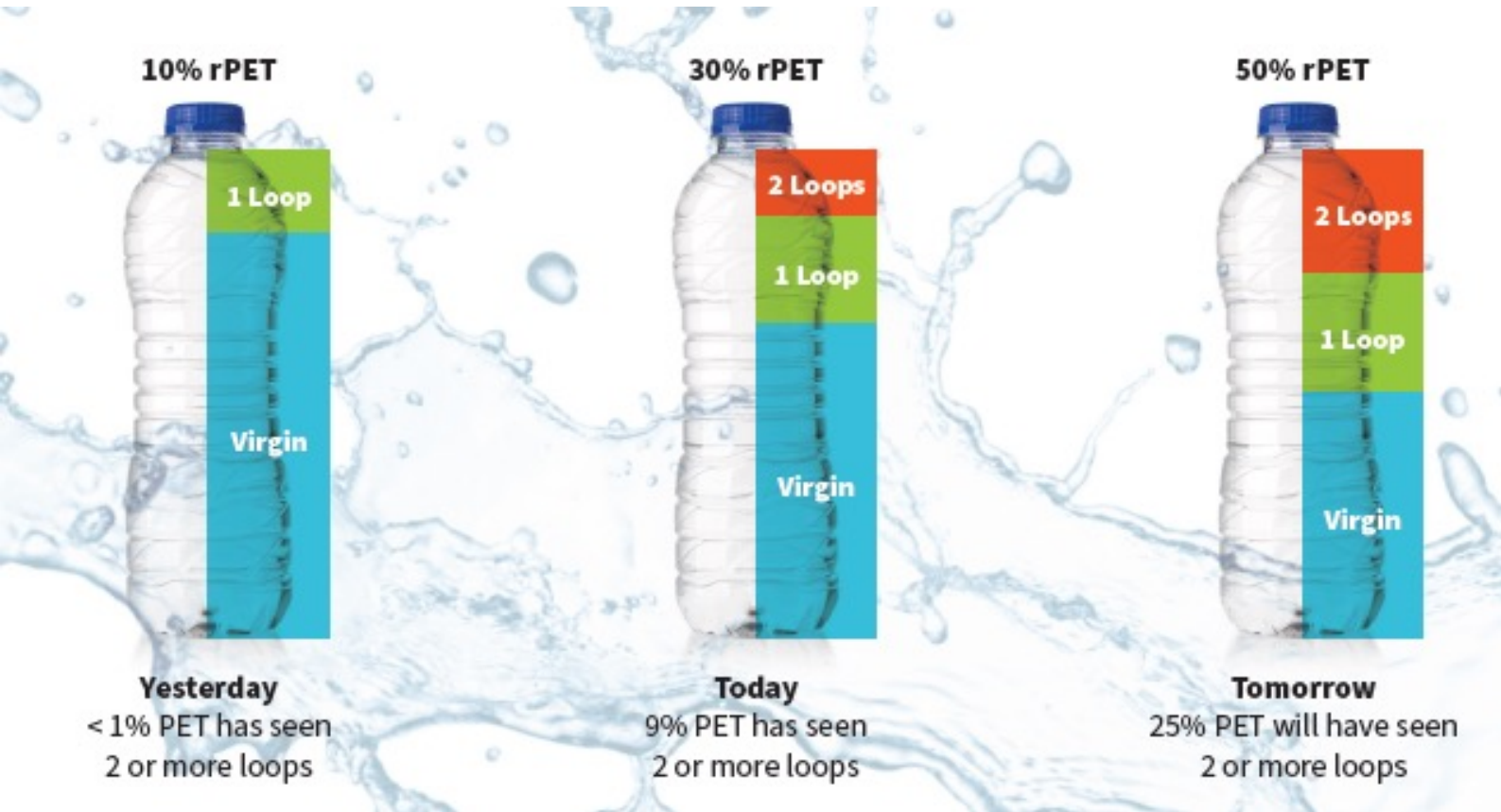
# SHIFTING FOCUS START WITH THE END IN MIND

ANDREA SMITH

GLOBAL PRODUCT MANAGER - AVIENT



# A CHANGING INDUSTRY



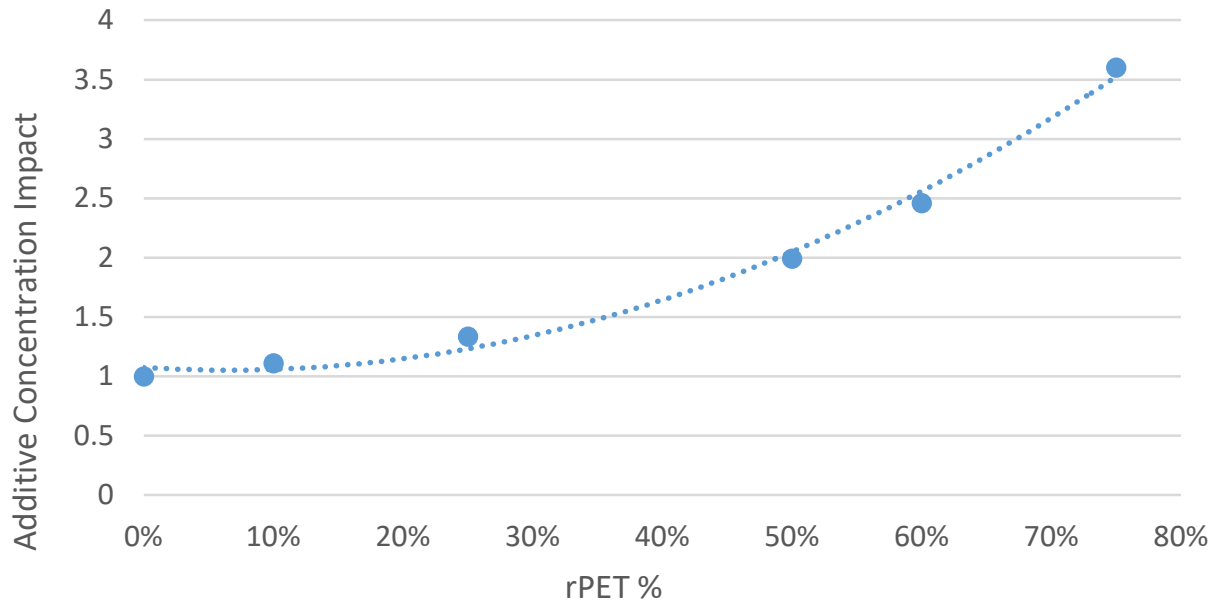
Increased yellowing and color variability

Reduced processability

Increased risk of NIAS

# ADDITIVE ACCUMULATION

Additive Conc. Impact vs % rPET



- Representative of a closed-loop recycling system
- As rPET is incorporated, multiple dosing occurs, leading to accumulation
- Potential risk of accumulation of other NIAS components
- Increased levels due to accumulation leads to increased levels of migration



# OTHER REGULATORY RESTRICTIONS

- Increased sensitivity in detection levels and regulatory changes have led to additional compliance requirements
- For example, regulatory amendments imposed by Commission Regulation (EU) No 2020/1245 on Commission Regulation (EU) No 10/2011
- September 2022:
  - 2-Aminobenzonitrile
  - Additional toxicology testing, and migration studies show compliance

# WHAT IS THE SOLUTION?

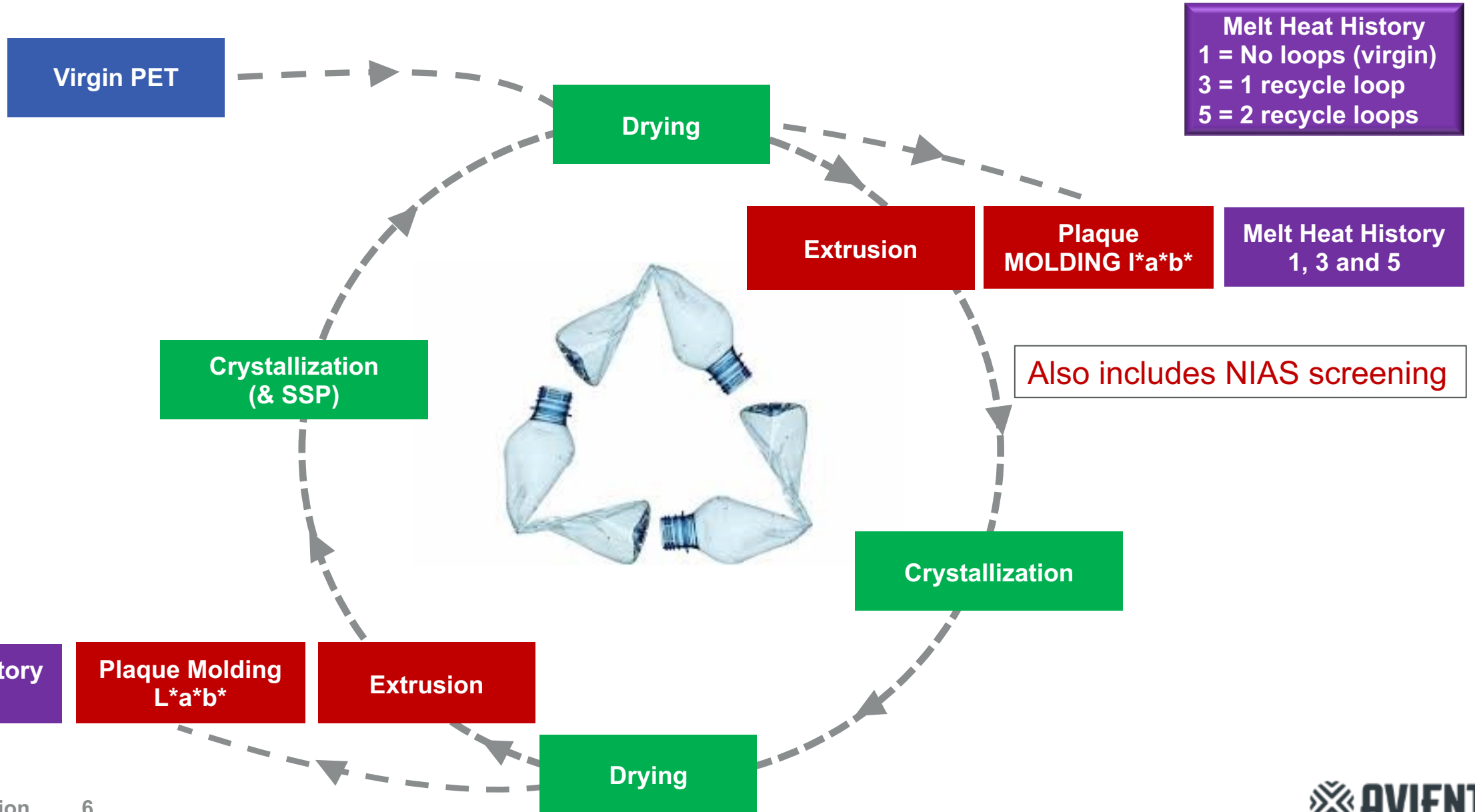
START WITH THE END IN MIND



To achieve circularity,  
product development  
and improvement must  
be driven by:

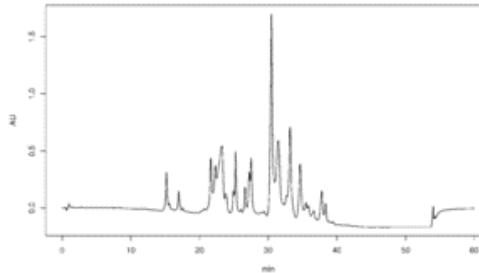
- Recycle screening
- NIAS screening

# AVIENT HEAT STABILITY PROTOCOL

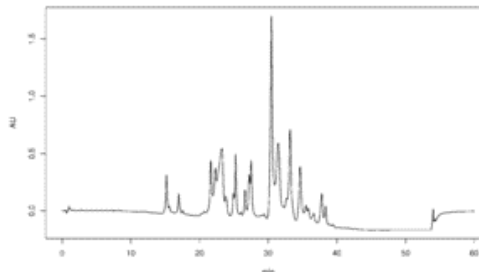
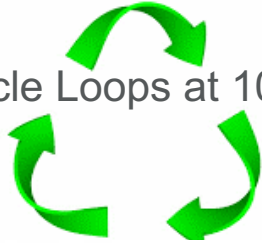


# WHAT IS NIAS SCREENING?

Virgin PET + ColorMatrix™ Additive



2 Recycle Loops at 100% rPET



GC-MS and LC-MS  
analytical testing



## REGULATORY

- Identification and quantification of known and unknown compounds
  - Includes non-intentionally added substances (NIAS)
- Safety assessment based on data generated

# COLORMATRIX™ AANCHOR™



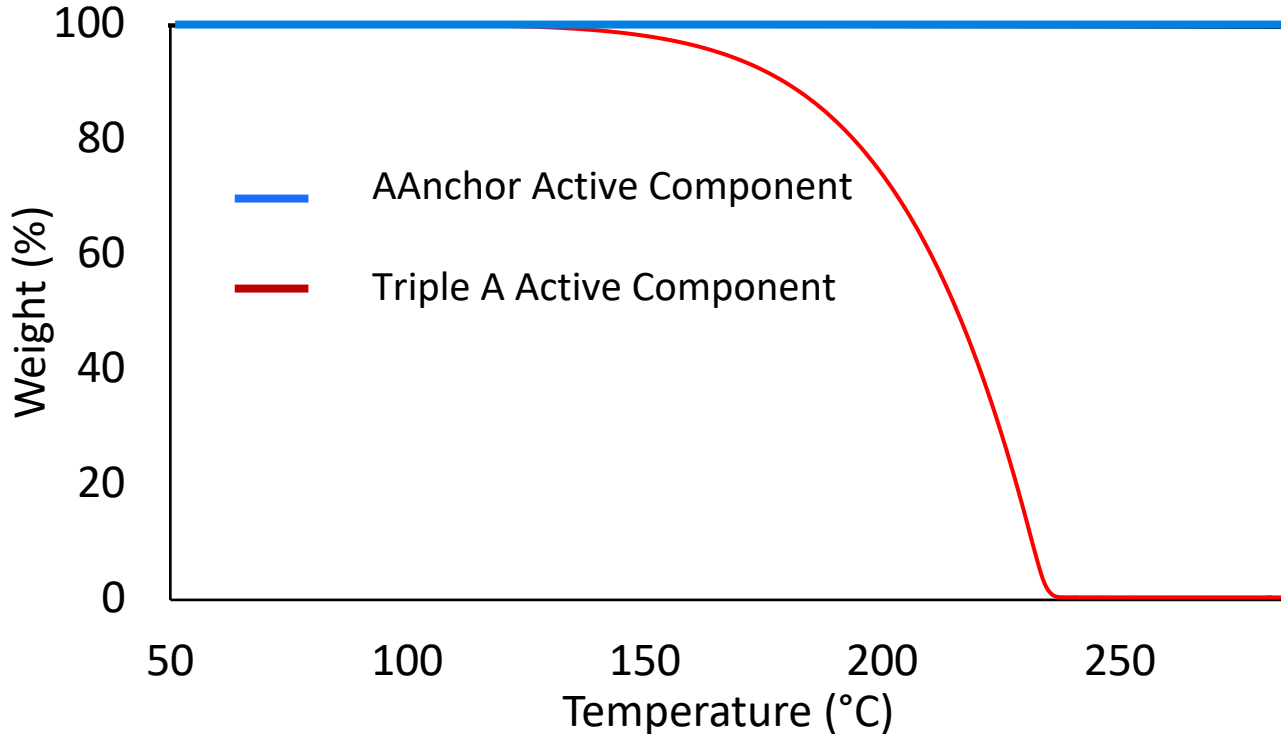
## Next-generation AA scavenger technology:

- Brand new molecule
- New, patented technology
- Commercial since June 2023
- Improved recyclability:
  - No sublimation
  - No mold deposition
- No migration risk from:
  - Anthranilamide (ATA free)
  - Active component of scavenger
  - 2-Aminobenzonitrile



# A FULLY CIRCULAR SOLUTION

Thermogravimetric Analysis Comparison



Reduced weight loss at PET processing temperatures:

- No sublimation
- No deposition

Migration Testing

Recycle Loop	AAnchor Conc (mg/kg)
0 (Virgin)	<0.005
1	0.0080
2	0.0098
3	0.0109
4	0.0115
5	0.0119

- Modeling accumulation in a 60% recycle closed-loop recycling system
- Migration after 10 days at 60°C

Reduced migration of active scavenging component:

- Will not exceed regulatory limits due to accumulation
- Is compliant with both migration testing protocols

# COLORMATRIX™ AANCHOR™



- Officially launching January 2024
- Webinar for launch February 2024

## THANK YOU

- Questions?
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