

# Transducer Engagement

Rose Tavery  
Sr. Mechanical Engineer




1

---

---

---

---

---

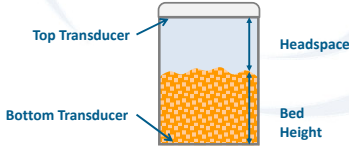


---

---

---

## Objective

- Review Interactions Occurring in Solid-Solid Mixing
- Influence of Headspace on Mixing Power and Scaling
- Transducer transfers energy from one type to another

2

---

---

---

---

---

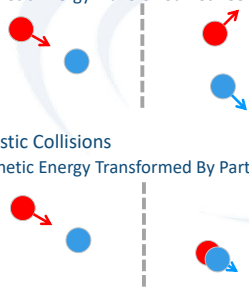


---

---

---

## Comparing Elastic vs Inelastic Particles

- Elastic Collisions
  - Kinetic Energy Transferred Between Colliding Particles
- Inelastic Collisions
  - Kinetic Energy Transformed By Particles

3

---

---

---

---

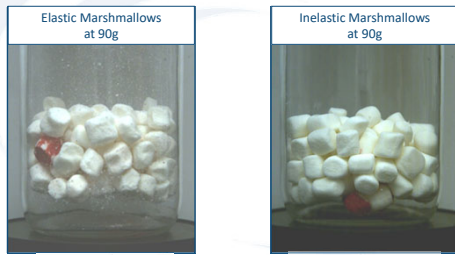
---

---

---

---

## Comparing Elastic vs Inelastic Particles



4

---

---

---

---

---

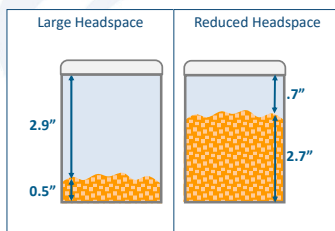
---

---

---

## Dual Transducer Theory

- Elastic Powder RAM Mixing



5

---

---

---

---

---

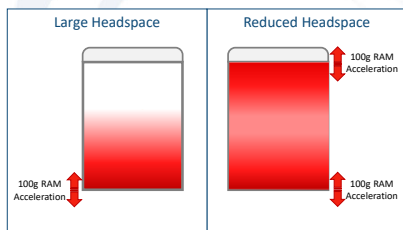
---

---

---

## Dual Transducer Theory

- Elastic Powder RAM Mixing
  - Solid Particle Collisions are Initiated by the Vessel's Transducers



6

---

---

---

---

---

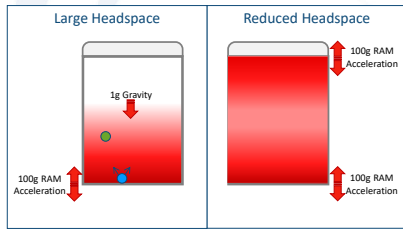
---

---

---

## Dual Transducer Theory

- Elastic Powder RAM Mixing
  - Solid Particle Collisions are Initiated by the Vessel's Transducers



7

---

---

---

---

---

---

---

---

---

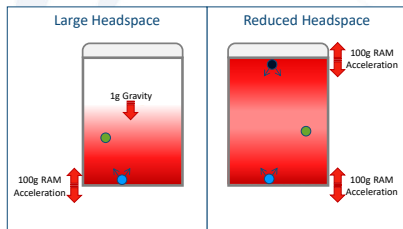
---

---

---

## Dual Transducer Theory

- Elastic Powder RAM Mixing
  - Solid Particle Collisions are Initiated by the Vessel's Transducers



8

---

---

---

---

---

---

---

---

---

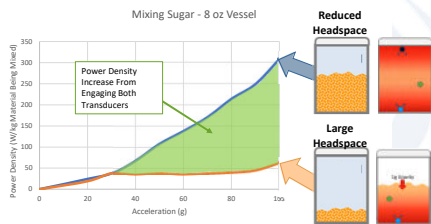
---

---

---

## Headspace In Practice – Elastic Particles

- Engagement with the Second Transducer is Affected by Adjusting Acceleration and Headspace



9

---

---

---

---

---

---

---

---

---

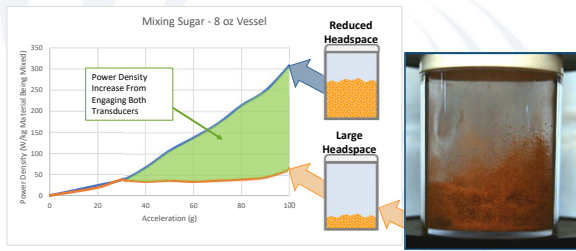
---

---

---

## Headspace In Practice – Elastic Particles

- Engagement with the Second Transducer is Affected by Adjusting Acceleration and Headspace



Resodyn  
ACOUSTIC MIXERS

10

Technical  
InterChange 2025

10

---

---

---

---

---

---

---

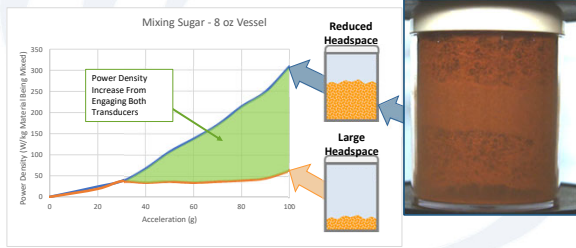
---

---

---

## Headspace In Practice – Elastic Particles

- Engagement with the Second Transducer is Affected by Adjusting Acceleration and Headspace



Resodyn  
ACOUSTIC MIXERS

11

Technical  
InterChange 2025

11

---

---

---

---

---

---

---

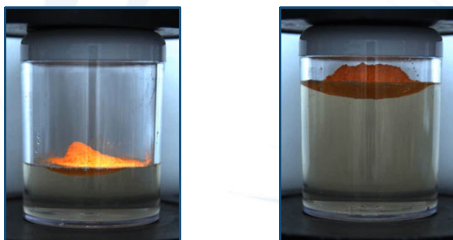
---

---

---

## Headspace in Practice - Paste

- Engagement with the second transducer can be critical to paste mixes



Resodyn  
ACOUSTIC MIXERS

12

Technical  
InterChange 2025

12

---

---

---

---

---

---

---

---

---

---

### Increasing Transducer Contact

- Reduce Headspace to engage with 2<sup>nd</sup> transducer
- Increasing the Vessel's Aspect Ratio

Resodyn  
ACOUSTIC MIXERS

13

Technical  
InterChange 2025

13

---

---

---

---

---

---

---

---

---

---

### Headspace and Process Scaling

- Increasing Transducer contact and Material being mixed

Resodyn  
ACOUSTIC MIXERS

14

Technical  
InterChange 2025

14

---

---

---

---

---

---

---

---

---

---

### Continuous Acoustic Mixing

The CAM Stack Construction Reduces Headspace and increases transducer contact by Using Multiple Transducers

Resodyn  
ACOUSTIC MIXERS

15

Technical  
InterChange 2025

15

---

---

---

---

---

---

---

---

---

---

## Continuous Acoustic Mixing

The CAM Stack setup is available for both RAM5 and OmniRAM mixers



16

Technical  
InterChange 2025

16

---

---

---

---

---

---

---

---

## Summary

- Solid Particle Collision Intensity Increases with Increased Acceleration and Transducer Contact
- Headspace Influences Mixing Intensity
  - Particles more distance from the transducer see reduced impact forces
  - Engaging a second transducer improves mixing performance
- CAM Stack is an option for increasing transducer contact for larger mix quantities



17

Technical  
InterChange 2025

17

---

---

---

---

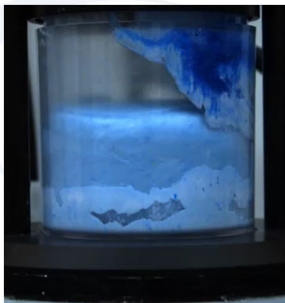
---

---

---

---

## Dual Transducer - Paste



Technical  
InterChange 2025

18

---

---

---

---

---

---

---

---

Thank you for your time  
and attention.



19

Technical  
InterChange 2025

---

---

---

---

---

---

---

---