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ELEVATOR TROUBLESHOOTING

Causes, Effects, Solutions

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Three Categories

- Discharge
  - Down-legging
  - Back-legging
- Premature Bucket Failure
  - Wear
  - Cracking
- Bucket Filling
  - Uneven Fill
  - Incomplete Fill

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Discharge Back-legging

- Back-legging describes elevated material falling down the up leg.
  - Causes
    - Speed too fast
    - Buckets worn
    - Obstruction in head or throat
    - Pressure vent or internal structure

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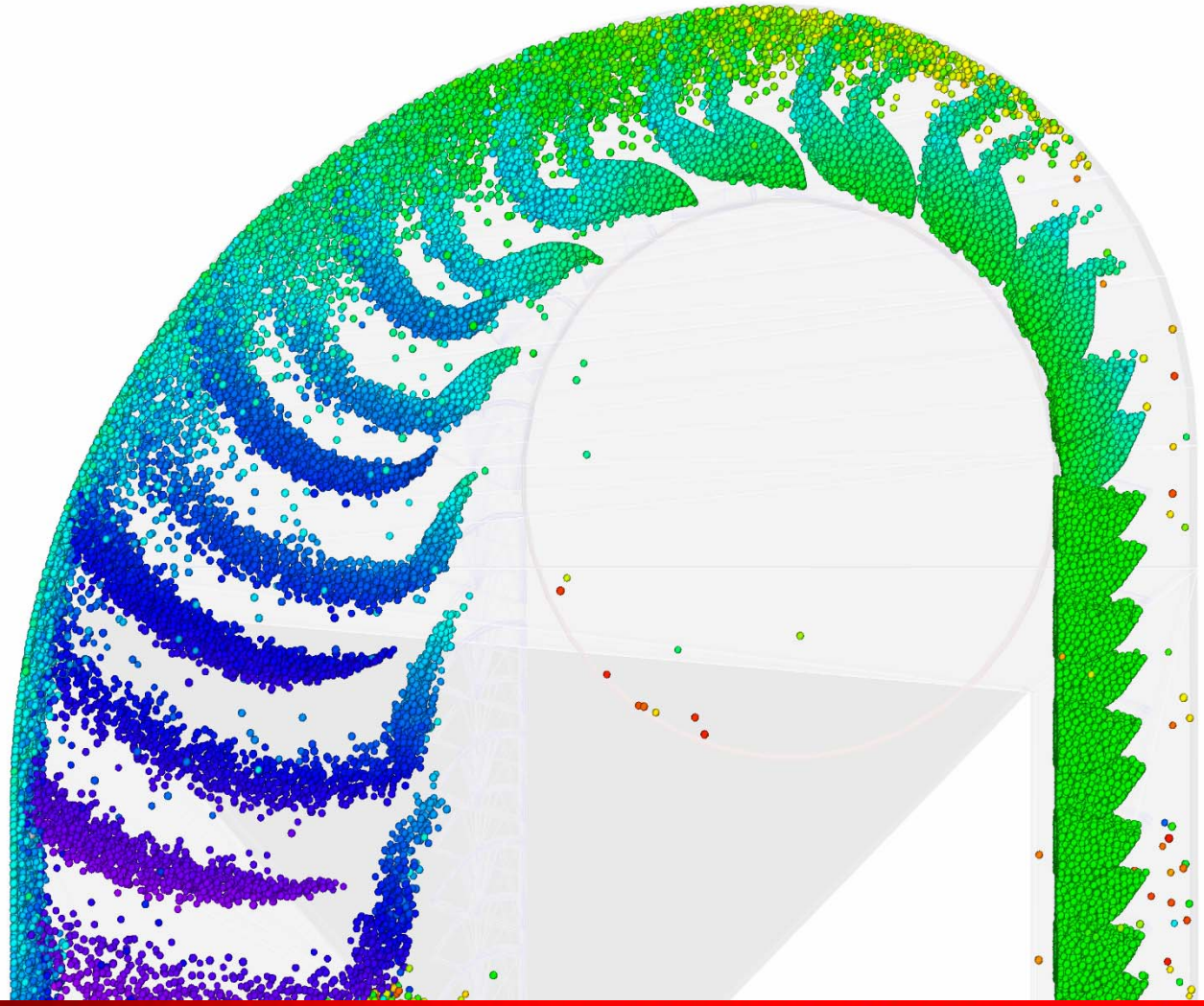
Typical throw Pattern for High Speed Grain Leg



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Shroud in Head

Helps control material flow and reduce discharge problems

CKETS & ACCESSORIES

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Discharge Down-legging

- Down-legging describes elevated material falling down the down leg.
  - Causes
    - Speed too fast/slow
    - Wiper damaged or missing
    - Throat position too high
    - Buckets un-vented
    - Obstruction in Throat
    - High moisture/Sticky Material
    - Air Pressure in Leg

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Bucket Discharge

- The point at which material starts to exit the bucket is determined by belt speed, and commodity being conveyed.
- A high speed elevator will begin to discharge at about 30-40 degrees before top dead center
- Complete discharge should occur at approximately 100 degrees below top dead center.

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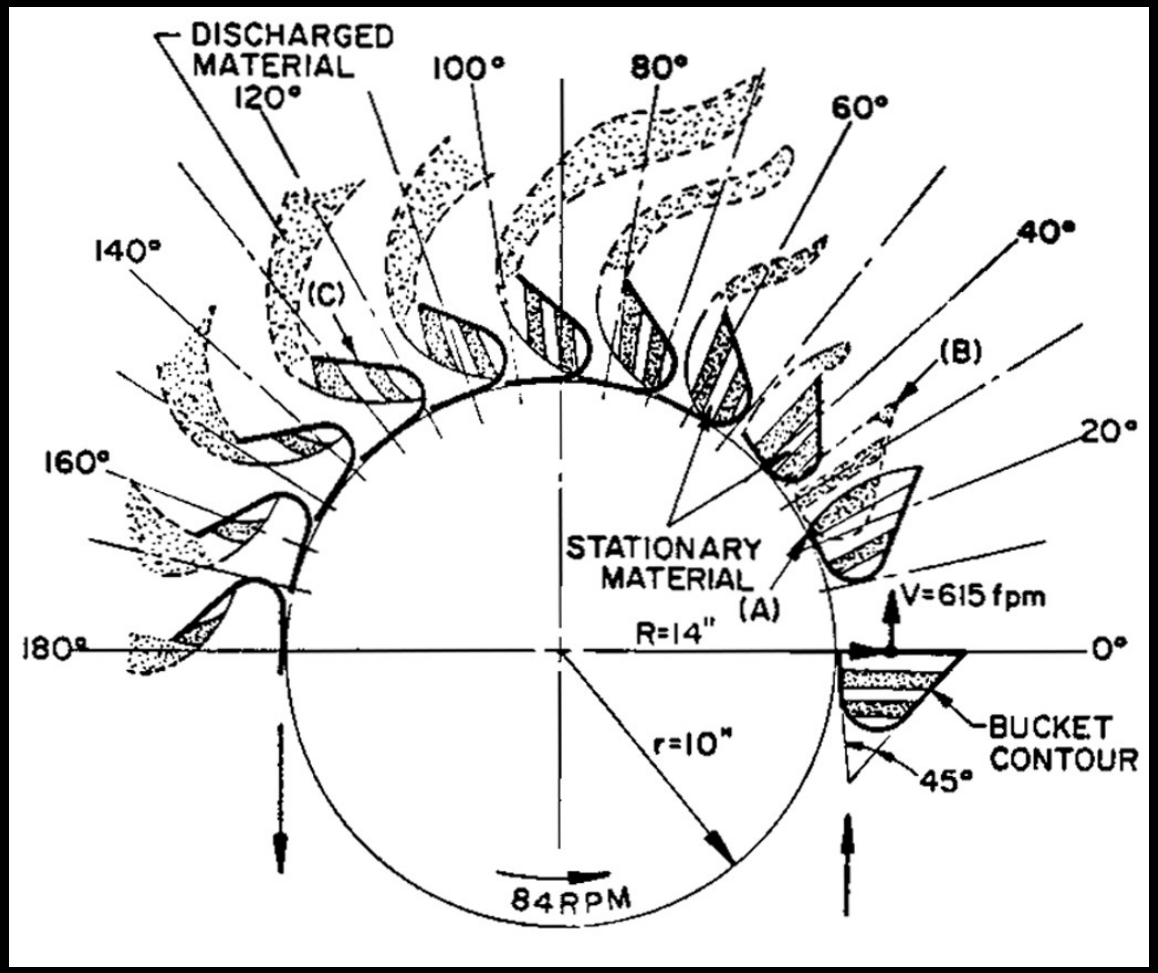

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Discharge Position

- As speeds and capacities have gone up, throat position has gone down
- Most manufacturers have a minimum position of 45° below centerline of head shaft

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Bucket Discharge

- In theory, capacity can be gained by increasing belt speed.
- Practical application can be tricky

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Speed Increase Effects

- Earlier Discharge
- Higher throw trajectory
- Increased air volume
- Reduction of time window
- Increase in commodity damage

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Bucket Fill Problems

– Causes

- Misguided inlet
- Buckets un-vented
- Pulley/inlet position not optimal
- Speed too fast
- Vertical spacing
- Inlet undersized
- Buckets worn
- Air Pressure in Leg
- Obstruction

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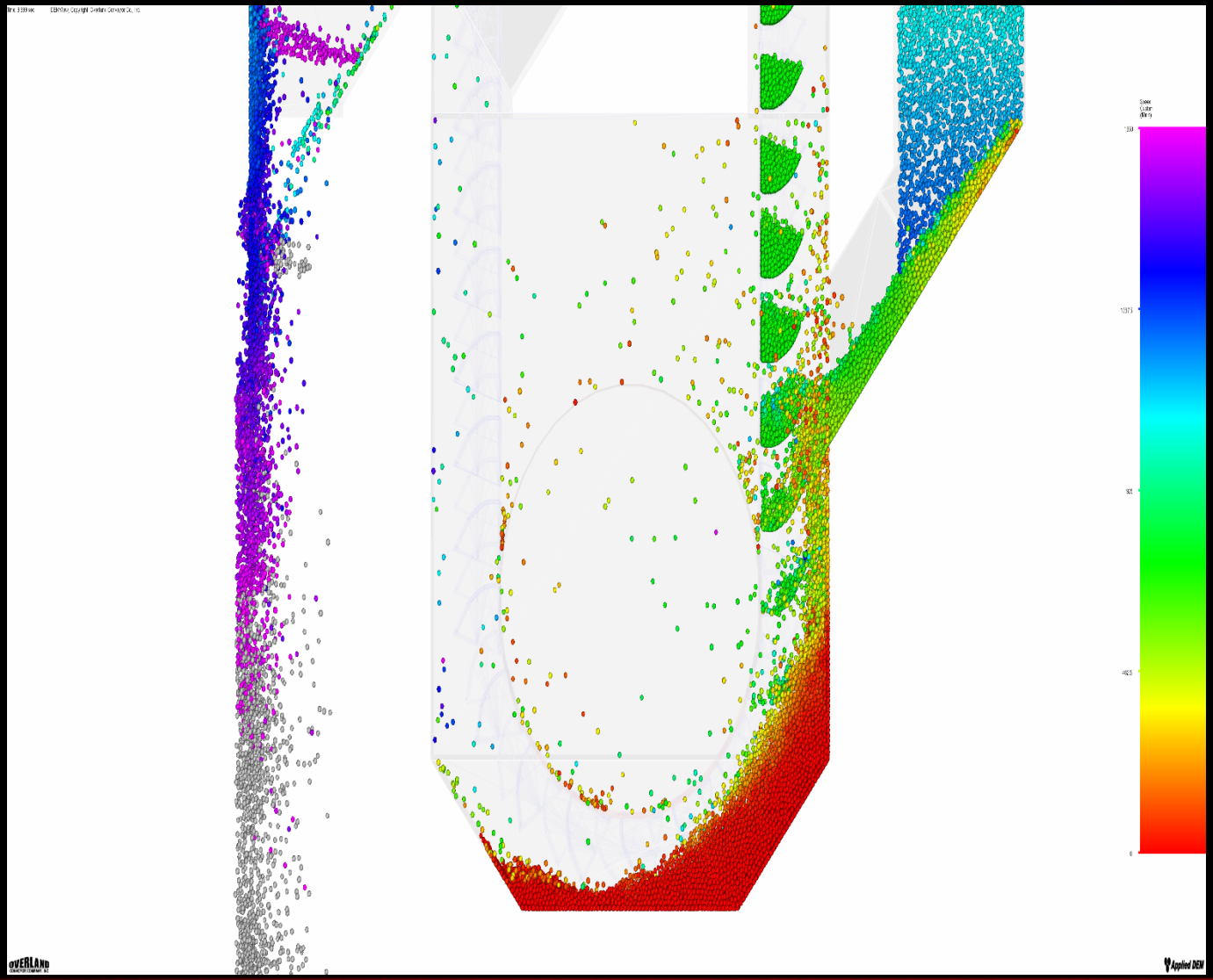
Upside
Feed
Optimal
Pulley
Position



WWW.MAXILIFT.COM: YOUR SOURCE FOR BUCKETS & ACCESSORIES

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To Vent or Not to Vent

- Conveying meals or soft stock materials
- Sticky or high fat content
- Any light test weight materials
- Powders or flours
- WHEN IN DOUBT, VENT YOUR BUCKETS!

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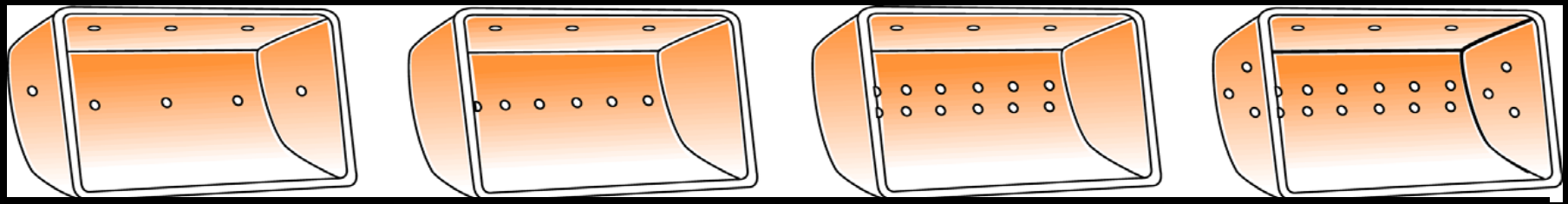
Bucket Venting

Aids in fill and discharge of light fluffy, or poor flowing materials.
Service provided at a nominal charge.



Standard Vent	#2 Vent	#3 Vent	#4 Vent
Same holes in body as mounting holes	Twice as many holes in body as mounting holes	Four times as many holes as mounting holes	Same as #3 Plus three holes in each end

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PREMATURE BUCKET FAILURE

- Causes
  - Improper hardware selection
  - Over-torqued hardware
  - Incorrect bucket or belt size
  - Misaligned belt
  - Excessive digging
  - Poor inspection practices
- Solutions
  - Must install a locking device
  - Use proper torque settings
  - Ensure buckets and belting are proper widths
  - Install digger buckets
  - Regular inspections to replace damaged buckets

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Excessive Bucket Wear

- Misguided or poor feeding
  - Buckets must dig to fill
  - Material overloading one side causing mis-alignment
- Improper bucket Material
- Application tends to cake or build up in trunking
- Severe downlegging causing heavy digging

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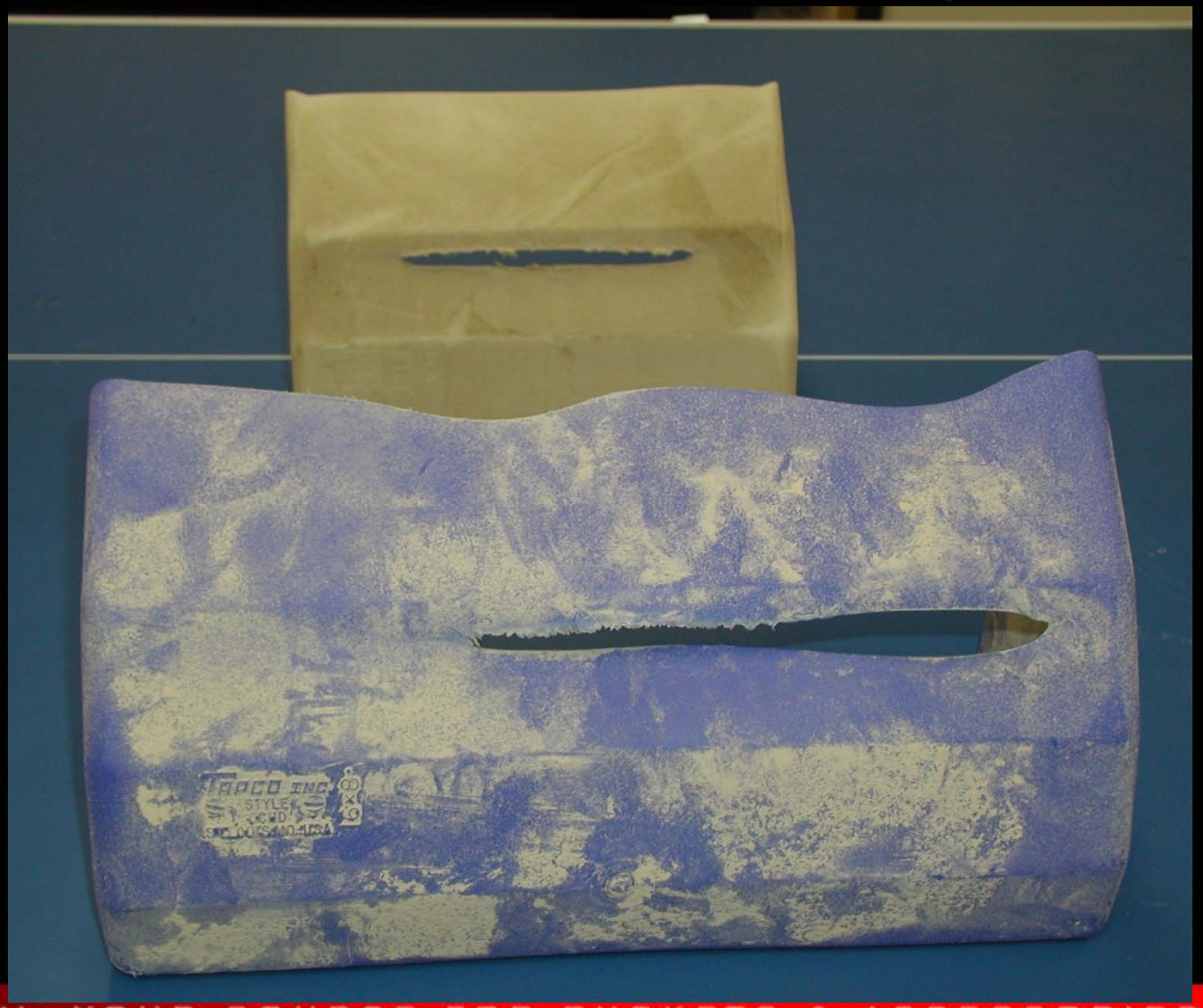
Bucket with holes in belly



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Urethane buckets in mash leg at Prestage Farms.

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Cracked bolt holes

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Cracked Bolt Holes - Cause

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BUCKET MATERIALS

Prime Virgin Polyethylene	Zytel Nylon	Urethane – 55 Durometer
		
For Grain and Food Products	Hot, High Impact, Abrasive products	Heavy Abrasion or Sticky Materials
-120F to +180F (210F Intermittent)	-60F to +300F (350 Intermittent)	-60F to +180F (210F Intermittent)
FDA Food Grade Material	Food Grade Available on Request	FDA Food Grade Material

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Polyethylene Vs Urethane

- Turkey feed mash leg
- 354,000 tons throughput
- Poly samples lost +1” off lip
- Capacity loss 50%
- Urethane showed no appreciable wear

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The Cost of Bucket Wear

- **10x6** poly bucket
- Water level new = 194.04 cubic inches
- 1” wear on front lip =164.15 cubic inches

•Loss of 15.4% capacity

- **14x7** poly bucket
- Water level new = 356.4 cubic inches
- 1” wear on front lip = 265.35 cubic inches

•Loss of 25.5% capacity

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Questions?