Best Practices for Sanitary Transport of Dry Bulk Materials

IAOM District Meeting
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Branson, MO

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Director Food Safety and Regulatory,
ADM Milling
Objective

Open discussion on best practices for transporting dry bulk products in pneumatic trailers

- Compliance with FDA’s FSMA Sanitary Transport regulations
- Key areas highlighted include:
  - Areas of contamination for bulk truck flour
  - Key sanitary design/delivery requirements
  - Situations resulting in high dollar claims for mill and carrier

- NOTE: Best practices are based on the opinions of the IAOM xFood Protection Committee. Each location must comply with their local procedures.
FDA Sanitary Transport Regulations

• Very Basic Requirements – Not specific for dry bulk
  • Supplier Approval
    • Carrier, Wash Station, Maintenance
  • Defined Roles
    • Shipper – primary responsibility unless assigned in writing to other roles.
    • Loader
    • Carrier
    • Receiver
  • Vehicles and transport equipment design and maintenance
  • Operations
  • Training
  • Records

• Miller needs to provide requirements to carrier - Contract
Truck/Trailer/Component Design
Truck/Trailer/Component Design

• Tanks SS or Aluminum
  • Internal Finish Smooth (welds ground) no harborages
  • External Frame preferred

• Hatch- SS or Aluminum
  • Sealable
  • Risk of shavings on the lock downs.
  • SS preferred or fitted with wear plate
Truck/Trailer/Component Design

- Hose Tube/Carrier
  - Fully enclosed accessible from both ends
  - Sealable
- Vent Sock (if used)
  - Clean/No Fray
Truck/Trailer/Component Design

• Blower
  • Food Grade Oil
  • Best practice is filter installed after blower

• Stingers banned on dedicated drop load trailers
  • If needed, focus point on wash and inspection
Truck/Trailer/Component Design

• Tank Pressure Relief
  • Installed with sealable Cam-lock fitting for easier removal for washing

• Blowdown pipe
  • Screened or with flapper to prevent pest entry
Truck/Trailer Design

• Inline unloading screen
  • Drilled SS plate for durability—no mesh or screens
  • 1/4” – 7/16” holes for white flour.
  • Larger for granular products

• Permanently attached to Truck
  • Ensure’s driver use
  • Will not protect carriers hose
  OR

• Installed at customer connection
  • Portable
  • Full protection of carriers components
  • Concerns if mounted in vertical manner
Truck/Trailer/Component Design

• Hoses – Food grade – labeled
  • Grounding wire integrated into material

• Cam-lock Fittings
  • Historically a source of metal filings
  • Best Practice is blue gasket (40 durometer – measure of hardness)
    • Compresses more – less bind on cams
    • Easy to find in product
  • Rings on Cam’s must be soldered so seal can’t be removed
Trailer Maintenance Practices
Trailer Maintenance Practices

• Carriers should have maintenance procedures
  • Acceptable tool lists
  • Tool reconciliation
  • Post maintenance procedures
    • Inspection and sign off by carrier
    • Post Maintenance conversion wash
    • Post maintenance product flush to remove shavings in horizontal lines that water may not flush out.
Trailer Wash

ONLY IN TEXAS!
Wash Design

• Potable water source – 40 CFR drinking water standards
  • Recycle water limitations.
• 5 micron filter on water line
• Back flow valves installed and tested
• Piping after 5 micron filter must be non-corrosive (no galvanized)
• Chemicals used in water heating (boiler) must be approved for food use.
• Wash spinner nozzle maintenance and inspection
Wash Procedures

• Frequency – as needed 14 days typical (21 day)
  • Cycle starts on date of first load after wash, not date of wash

• Disassemble trailer
  • Hoses removed from tube, caps removed
    • Wash on racks – do not rest or wash hoses on floor or ground.
  • Inspect all gaskets. Hose fitting gaskets removed for washing
  • Hand wash all associated equipment with same process as tank.
  • Wash must include all air lines and other hidden areas (stingers, pressure relief, etc.)
# Best Practice Wash Process

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Water Used</th>
<th>Water Disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Rinse to Remove Solids</td>
<td>Recycled final Rinse water from approved prior wash</td>
<td>Drain – Not recycled</td>
</tr>
<tr>
<td>Wash (15 minutes)</td>
<td>Fresh Water (use hot if available)</td>
<td>Drain – Not recycled</td>
</tr>
<tr>
<td>Final Rinse</td>
<td>Fresh Water (use hot if available)</td>
<td>May be recycled for next load’s initial rinse (if compatible)</td>
</tr>
</tbody>
</table>
Wash Procedures

• Drying
  • Blower preferred or fan air used for drying must be filtered to 150 micron.
    • Best Practice - 10 micron on blower filters
  • If blower used, food grade oil required.

• Post wash Sealing
  • Tamper evident seals applied to all product access points on trailer prior to leaving wash station. Recorded on wash ticket.
Wash Procedures

• Conversion wash:
  • Required after internal maintenance, and certain prior loads
  • Prior to Initial Cold Rinse – Additional Steps
    • Disassemble Aerators, Bottom product lines, valves, tees, couplers
    • Remove all gaskets
    • Hand rinse and wash all parts.
  • Before reassembly perform wash cycle
  • Inspect interior of tank and all components for residue
  • Reassemble all components
  • Perform 2\textsuperscript{nd} wash and final rinse.
# Acceptable Previous Commodities and Pre Load Minimum Requirements

When Loading Truck with

<table>
<thead>
<tr>
<th>When Previous Commodity is:</th>
<th>Patent/1Cl Flour</th>
<th>2Clr Flour</th>
<th>WW Flour</th>
<th>Farina</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent/1Cl Flour (Dusting)</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
</tr>
<tr>
<td>Patent/1Cl Flour (More than dusting)</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
</tr>
<tr>
<td>2Clr Flour (Dusting only)</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
<td>Inspect</td>
</tr>
<tr>
<td>2Clr Flour (More than dusting)</td>
<td>Wash</td>
<td>Inspect</td>
<td>Inspect</td>
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<td>Wash</td>
<td>Inspect</td>
</tr>
</tbody>
</table>

| Any Competitor Wheat Product         | Wash             | Wash       | Wash     | Wash   |
| Durum Wheat Products                 | Wash             | Wash       | Wash     | Wash   |
| Malted Barley Flour                  | Wash             | Wash       | Wash     | Wash   |

When Previous Commodity is:

<table>
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<tr>
<th>Prior to Loading any Wheat Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn products</td>
</tr>
<tr>
<td>Sorghum Products</td>
</tr>
<tr>
<td>Rice Products</td>
</tr>
<tr>
<td>Sugar Products</td>
</tr>
<tr>
<td>Salt</td>
</tr>
</tbody>
</table>

Prior load had Foreign Material or other food safety issue

| Follow Return to service requirements including conversion wash and product flush. |

New Trailer

| Follow Return to service requirements including conversion wash and product flush. |

All Other Previous commodities/materials

| May not load regardless of wash without Div. QA Approval |

Conversion Wash Required
Product Handling and Delivery

Correct Product
Correct Trailer
Correct Customer
Correct Bin
Product Handling and Delivery

• Drivers
  • Drivers must wear clean, appropriate clothing. Uniform preferred.
  • Carrier must have personal hygiene program for drivers that address GMP’s
    • Hand washing
    • Tobacco use
    • Eating
    • Hair restraints
    • Restroom use
    • Conduct
    • Prevention of Foreign Materials and Allergens
Product Handling and Delivery

• Pre-Trip
  • Confirm all required paperwork and samples are present. Read and comply with any special instructions on BOL
  • If Pre-load, hook to trailer THEN verify the following
    • Check a rear or bottom compartment seal number compare to those on BOL. Verify Trailer number. Report problems to dispatch or Milling company. DO NOT DELIVER
Product Handling and Delivery

- BEST PRACTICE:
  - Use electronic locker/vending system to lock up paperwork, sample and glad hand trailer locks.
Product Handling and Delivery

• Arrival at Customer
  • Check with guard or receiving personnel for instructions.
  • Prior to unloading visually note condition of unloading areas and fittings at customer. If any concerns for personnel safety, product safety, worn fittings call dispatch. Do not confront the customer.
  • Do not cut seals without permission from the customer.

• Sampling procedure
  • Drivers are not allowed to climb on top of trailers to obtain samples. Customer personnel may with proper fall protection.
  • Ensure clean sample scoop is used. Hair restraints required. No glass.
  • Extreme car shall be taken by customer to prevent foreign material from entering the trailer. (Insects, perspiration, dirt, loose items, dust, rain, etc.) Driver should note any concerns on delivery report.
Product Handling and Delivery

• Unloading
  • Driver is not allowed to turn any valves or press any buttons without authorization each and every time from customer.
  • Prior to unloading driver must get customer’s signature of authorization and bin number/name on BOL or trip sheet.
  • Driver must remain in attendance (awake, outside vehicle, within 25 feet in view of unloading process.)
Product Handling and Delivery

• Unloading
  • Inline screen used at point of hook up to customer or on truck
  • Camlock shims
    • Many milling companies ban shim use.
    • If used made of non-rusted ferrous metal that is secured so it cannot enter product.
    • No shim may be used downstream of inline screen. Loose or leaking fittings must be reported ASAP so repairs can be made
  • Cam lock caps and plugs that are removed from pipes shall be coupled together and placed off the ground. Uncoupled caps and plugs that come in contact with any unsanitary surface must be cleaned prior to use.
  • Hose ends and connection points must not come in contact with the ground. Many companies require hoses to remain off ground.
Product Handling and Delivery

• Unload Completion
  • Inspect inline screen. If installed in vertical position, the connecting hose must be checked for material that may have dropped off screen.
    • Any material found that is not flour, dough or clean scale must be bagged, recorded and immediately communicated to dispatch and Milling Company.
  • Properly store inline screen, hoses and fittings.
  • Place return seals on all broken access points and record seal numbers on BOL or other form.
    • Inspect area for spills, debris or broken seals. Clean up area.
    • Significant spill need to be reported to customer and dispatch

• Trailers returning with product must be verified as fully sealed.
THANKS AND QUESTIONS

• Special thanks to my fellow IAOM Food Protection Committee members for their input

• Committee plans to finalize these best practices in a document to share with IAOM membership

• Questions?