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OPERATION PROCEDURES

# Care and Maintenance of PHOS-CHEK® LCE20-Fx Fire Retardant Product

PHOS-CHEK FIRE RETARDANT | FOAM | GEL

## OBJECTIVE

To ensure the consistent quality, operational safety, and optimal performance of PHOS-CHEK® LCE20-Fx fire retardant product through proper handling, recirculation, equipment maintenance, and seasonal procedures at base and airbase facilities.

## GENERAL GUIDELINES

- Wear appropriate PPE during all product handling and equipment maintenance.
- Maintain a regular schedule of equipment inspection and product recirculation.
- Document and photograph any issues, foreign debris, or abnormalities during inspection and cleaning.

## DAILY FIRE SEASON OPERATIONS

- Recirculate all storage tanks at least once daily, preferably in the morning before fire operations, prior to loading air tankers.
- Ensure Micro Motion Meter reads 1.0 (water baseline) prior to loading.
- Continuously monitor pressure gauges and check filters for debris buildup.

If there were no fire operations, all tanks should be recirculated at least once weekly.

## RECEIVING PROCEDURES

- Collect LAQA delivery sample during transfer to base storage in thirds to represent beginning, middle, and end of transfer (e.g., after beginning transfer collect 1/3 of sample, about the half-way point collect another 1/3 of sample, and prior to completion of transfer collect the final 1/3 of sample in a single container – this ensures a composite and representative sample of the entire truckload. Verify that sample port on pump is clean, empty and free flowing prior to collecting any sample).

Upon completion of delivery, recirculate the receiving tank before transferring product or mixing contents.

- Avoid transferring stagnant product.
- Recirculate product until tank turnover is achieved twice (e.g., 10,000 gallons at 500 gpm and twice through pump = 40 minutes).

## WINTER/OFF-SEASON MAINTENANCE

- Recirculate each tank a minimum of one hour, once per week, unless weather or power constraints prevent access or create unsafe conditions.

Winter recirculation is recommended to be achieved by air sparging using construction type, trailer mounted air compressors capable of producing from about 150 to 500 cubic feet per minute (e.g., large compressors normally used to operate a jack hammer).

- Drain, clean, and winterize pumps with RV antifreeze; manifolds and sight tubes should be drained and if possible blown clear with compressed air.
- Inspect and clean Micro Motion Meters, check valves, blenders and filters. Perform vinegar flushes as needed.
- Store disconnected components in a dry, protected area.

## EQUIPMENT MAINTENANCE

- Inspect pumps, pulleys, belts, hoses, and fittings regularly.
- Ensure all camlock fittings have intact gaskets.
- Grease pumps and refill grease cups per manufacturer guidance.
- Verify no leaks, corrosion, or mechanical wear before starting operations.

## PRODUCT-SPECIFIC NOTES

- PHOS-CHEK LCE20-Fx (liquid concentrate) requires a minimum of moderate weekly recirculation during fire season and daily during fire operations.
- Gum-thickened low, medium, and high-viscosity products may require less frequent recirculation. (In all cases, a minimum of daily recirculation during fire operations – more recirculation is always better).
- Always recirculate after adding concentrate to storage, prior to fire operations, collecting samples, or transferring product between tanks.

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## SAFETY & MONITORING

- Tanks must never be left unattended during recirculation.
- Regularly monitor for pressure spikes and confirm system integrity during operation.
- Take before/after photos during maintenance for documentation and QA/QC purposes.

Adhering to this SOP will help protect product integrity, minimize equipment issues, and ensure safety across all phases of fire retardant handling and deployment.

## SOP ADDENDUM 1: MICROMOTION METER (MM) FLUSH SYSTEM

### OBJECTIVE

To ensure the proper care, operation, and maintenance of the Micromotion Meter (MM) Flush System in all PHOS-CHEK LCE20-Fx base locations, this SOP addendum provides detailed procedural guidance for flushing, inspection, winter maintenance, and safe handling.

### DAILY FLUSH PROCEDURE

1. Prior to flushing, the base manager or designated personnel must confirm with agency representatives that aircraft operations have ceased for the day.
2. Verify all valves are in correct positions for the flush and ensure that the LC concentrate line is shut off to prevent contamination.
3. Perform the flush until water runs completely clear through the system. Immediately shut off the flush to avoid unnecessary water buildup.
4. All valves must be shut off and verified upon completion of flushing.
5. All flushed material is to be collected in a tote and stored for reuse in the next operational period. The mix master must monitor refractive index (RI) to ensure the mixed product remains within specification.
6. Mixing personnel must be fully trained and familiar with the Tote Flush System and valve functions. Any questions should be directed to the Base Manager or Regional Manager.

### WINTERIZATION & AIR SPARGE RECIRCULATION

1. Use a high-volume air source to introduce air into the tank. The goal is to mimic turnover achieved by traditional pump recirculation.
2. Sparge weekly to ensure product remains suspended and to avoid settling and separation.
3. Maintain tanks at full or near-full capacity to reduce vapor space. Excess vapor can lead to condensation, scale formation, and product hardening.
4. Use caution and standard PPE. Ensure all airlines are securely attached and operated away from foot traffic to avoid injury.

### SAFETY PRACTICES

- Never perform flushing or air sparging alone. Always follow buddy system protocol.
- Use proper PPE including goggles, gloves, hearing protection, and appropriate protective clothing.
- All maintenance activities should be logged, and photos should be taken before and after flushes or vinegar cleans.
- Avoid any discharge into storm drains or surrounding environment. Containment is required at all times.

Consistent flushing and seasonal maintenance of the MM system is essential to ensure product quality, prevent contamination, and extend equipment life. Adhering to this procedure reinforces safe practices and supports operational readiness at all base locations.

## SOP ADDENDUM 2: MICROMOTION METER (MM) VINEGAR CLEAN-OUT PROCEDURE, IF NECESSARY, FROM ABNORMAL BUILD-UP

### OBJECTIVE

To address potential inaccurate Micromotion Meter readings and remove abnormal internal buildup

### MATERIALS REQUIRED

- 2.25 gallons of white vinegar per meter
- 1 x 3-inch pellet stove cleaning brush with 4-foot flexible rod
- 2 x 90-degree camlock connectors with caps
- 1 x camlock cap with air chuck installed
- 1 x leaf blower
- Appropriate PPE

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## NOTES

White vinegar (5% concentration) can be found at most retail stores. Though not hazardous, avoid contact with skin, eyes, and clothing. Clean up any spills immediately, especially on concrete.

## PROCEDURE

1. Flush the meter with water until output is clear. Do not use the tote flush system for vinegar.
2. Use compressed air with a camlock air chuck to push out remaining water.
3. Attach 90-degree camlocks to each meter end. Fill with vinegar, allowing space for expansion. Cap securely.
4. Leave the meter powered and filled at least overnight (up to 3 days).
5. Drain vinegar and remove camlocks. Inspect meter tube openings.
6. Use the brush and flexible rod to scrub inside the meter tubes. Secure brush with duct tape.
7. Flush meter with water and check for removed buildup. Repeat if necessary.
8. Use a leaf blower to remove residual water until airflow is clear and no gurgling remains.

Following this procedure helps ensure measurement accuracy, prolong equipment lifespan, and maintain safety during operations.

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