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<td>Backflow preventers</td>
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Wisconsin Department of Agriculture, Trade and Consumer Protection, 2811 Agriculture Drive, Madison, WI 53718
This institution is an equal opportunity provider
DFS Food & Dairy Specialist Areas

Environmental Health Services Supervisor: Steve Stoner, 715-577-8639, Steve.Stoner@wi.gov
General Technical Specialists E-mail: DATCPTechnicalSpecialists@wi.gov

Wisconsin Department of Agriculture, Trade and Consumer Protection
F-fd-242 (rev 3/24/2021)
Requirements for Milking Equipment Plans

Sec. 93.06 (1w) Wis. Stats.  Sec. ATCP 65.14(6)(a) Wis. Admin. Code

All applications for Milk Handling Equipment and Facility Construction must include a plan. The department shall charge a fee of $25 to recover costs for providing the review service. Plans must be submitted to DATCP – Division of Food Safety and be reviewed prior to installation. All installations, modifications or replacements shall meet applicable requirements.

Examples of installations/modifications:

- Pipeline System Installation (new or used systems)
- Pipeline System or Component Modifications
  
  If the modification or replacement changes any of the following:
  
  - Size of milkline or main vacuum line
  - Length of milkline
  - Size or number of receiver jar inlets
  - Number of pipeline slopes
  - Number of milker units
  - Number of milker units per milkline slope
  - CFM of vacuum needed
  - Size of vacuum pump if CFM is less than previously installed

- Bulk Tank Installation (new or used tanks)
- Milk Pre-cooling Equipment Installations (new or used)
- Direct Tanker Milking Operations, in-line sampler
- AMI (automated milking installation)
- Milkhouse, new or modifications
- Milking Parlors, new or modifications
- Water Systems, new or updated systems for milk house or parlor
- On demand or tankless water heater
Application for Milk Handling Equipment and Facility Construction

Wis. Stats. s.97.22, s.ATCP 65.14(6)

Mail To: WDATCP 718 W Clairemont Ave Ste 128, Eau Claire WI 54701
Make Checks Payable To: WDATCP

- Wisconsin regulations require the installer to submit plans for review before the installation of a bulk tank or milking and milk handling system OR construction of, or modification to, a milkhouse, milking parlor or dairy farm water system on behalf of the producer.
  - Submit this application along with the $25 fee to the address above. The review fee must accompany this form or plans will not be reviewed.
  - Drawings, plans or supplemental applications may be sent either to the address above or submitted to datcpdfsplanreview@wisconsin.gov with the producers name in the subject line of the email submission.
  - Only plans that are complete and legible will be reviewed.

- The review of the plan and/or application is based on Wisconsin regulations and standards in effect at this time.
- Modification of this installation may be required at some future date as regulations and standards are updated.

### MILKING ANIMAL

- **COW**
- **GOAT**
- **SHEEP**
- **OTHER:**

### TYPE OF EQUIPMENT INSTALLATION

- **NEW**
- **MODIFICATION**

### TYPE OF EQUIPMENT

- **BULK TANK**
- **PRECOOLER**
- **PIPELINE MILKER**
- **SILO**
- **DIRECT TANKER** (Requires Supplementary Application: F-fd-258)
- **ROBOTIC MILKING SYSTEM** (AMI) (Requires Supplementary Application: F-fd-344)
  - Manufacturer of AMI(s): ____________________
  - Number of AMI’s installed: ___________
- **DAIRY FARM WATER SYSTEM** – Alternative Water Heating System
- **Other – explain**

### PRODUCER INFORMATION

- **NAME**
- **PHONE**
- **DBA/FARM NAME**
- **MAILING ADDRESS**
- **PHYSICAL ADDRESS** if different than mailing address.
- **CITY**
- **STATE**
- **ZIP**
- **COUNTY NAME**
- **TOWN NAME**
- **SECTION #**
- **PRODUCER’S SIGNATURE**
- **DATE**

### FACILITY CONSTRUCTION

- **NEW**
- **MODIFICATION**

### TYPE OF FACILITY

- **STANCHION BARN**
- **MILKHOUSE**
- **MILKING PARLOR**
- **SWING PARLOR**
- **FLAT BARN PARLOR**
- **ROTARY PARLOR**
- **OPEN AIR PARLOR**
- **WATER SUPPLY SYSTEM**
- **SUBWAY/TUNNEL**

---

**NOTE:** Immediately after installing or modifying any system listed above, the installer shall provide to the milk producer and the department a copy of the signed Certification of Installation Completion which certifies compliance with the construction standards of ATCP 65, Wisconsin Administrative Code.
INSTRUCTIONS

- Complete all blanks applicable to this installation
- This application must be accompanied by a detailed legible drawing of the milking system and water distribution system showing the following items, when present:


**FABRICATION OF MILKING SYSTEM**

### A. MILKLINE

1. Material(s)  
2. Diameter  
3. Length  
4. Welded □ Gasketed □  
5. Percent slope □ .8% (1 inch/10 feet) □ 1.2% (1 inch/10 feet) □ 2.0% (2½ inch/10 feet) □

### B. MILK RECEIVER

1. Number of Receiver Inlets  
2. Size of Receiver Milk Inlet(s)  
3. Size of Receiver Vacuum Inlet  
4. Located in a Pit? YES □ NO □  
5. Located in a Mini-Milkhouse? YES □ NO □

### C. OTHER SYSTEM COMPONENTS WITH VACUUM REQUIREMENTS (FILL IN THOSE THAT APPLY)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>ADDITIONAL VACUUM REQUIREMENTS</th>
</tr>
</thead>
</table>

### D. VACUUM SYSTEM

1. Main Airline Material:  
2. Pulsator Line Material:  
3. Automatic Drains in Pulsator Lines: YES □ NO □  
4. Vacuum Pump(s): Brand: Model(s): Motor hp:  
5. Total Vac Pump Capacity: CFM/ASME at Normal Operating Level of: In Hg  
6. Other (specify):  

### E. MILK COOLING AND STORAGE SYSTEM

1. Pre-Cooler Plate □ Tube □ Other:  
2. Number of sections in plate cooler: Does each section freely drain? YES □ NO □  
3. Coolant: Well water single use □ Recirculated water □ Recirculated glycol □  
4. Type of coolant preservative used:  
5. Bulk Milk Tank or silo Brand Model: Capacity: Date of Manufacture:  
6. Bulk tank temperature recorder provided? (Required on tanks manufactured after 1/1/2000) Type: Chart: Computer:  
7. Type of cleaning: MANUALLY CLEANED □ CIP □  
8. Distances from bulk milk tank to walls, ceiling and equipment provided on plan? YES □ NO □

### F. WATER HEATING EQUIPMENT

1. Water heating system adequate for all milking: YES □ NO □  
2. On Demand or continuous flow hot water systems: YES □ NO □  
3. Total hot water usage requirements and system capacity provided: YES □ NO □

### G. PHYSICAL SEPARATION OF WASH SYSTEM LINES FROM

1. Milking System During Milking: YES □  
2. Milk Tank During Milk Storage: YES □

### H. FACILITY CONSTRUCTION FINISH SCHEDULES

1. Complete wall, floor, ceiling and lighting schedule provided for new facility construction or modification?: YES □ NO □  
2. Has a sanitary waste permit been applied for?: YES □ NO □

This institution is an equal opportunity employer.

Personally identifiable information you provide may be used for purposes other than that for which it was collected. (Wis. Stat. §15.04 (1)(m)).
CERTIFICATION OF INSTALLATION COMPLETION

PRODUCER: «FIRST_NAME, MIDDLE_INITIAL, LAST_NAME»
            «DBA_NAME»
            «STREET_ADDRESS»
            «CITY_STATE_ZIP»

Date of application: «DATE_RECEIVED»

File # «Record»

PRODUCER SHALL POST IN MILK HOUSE FOR 12 MONTHS

I hereby certify that I have installed the equipment as described on this application and in compliance with Chapter ATCP 65, Wisconsin Administrative Code

«INSTALLER»

SIGNATURE OF EQUIPMENT INSTALLER OR REPRESENTATIVE:

DATE OF COMPLETION:

INSTALLER MUST SIGN THIS STATEMENT UPON COMPLETING INSTALLATION

PROVIDE A COPY FOR THE PRODUCER

PROVIDE A COPY FOR DATCP
DIVISION OF FOOD SAFETY,
718 W Clairemont Ave., Ste 128, EAU CLAIRE WI  54701
Fax: 715-839-3867
**Supplemental Application for Direct Tanker Milking Operations**

**Mail To:** WDATCP 718 W Clairemont Ave Ste 128, Eau Claire WI  54701

- The Department requires the installer, on behalf of the milk producer, to submit this supplemental application whenever a mobile tanker will be used to store milk on the farm.
- This form must be submitted in conjunction with the “Application for Milk Handling Equipment”, (F-fd-31).
- Only plans that are complete and legible will be reviewed.
- Coordinate the completion of this form between the installer, producer, milk hauler, and dairy plant to assure accurate information is provided.
- Refer to F-fd-71 “Direct Tanker Shipping from the Farm Requirements” document for guidance.
- The review of your plan and/or application is based on Wisconsin regulations and standards in effect at this time.
- Modification of this installation may be required at some future date as regulations and standards are updated.

**Please Print Clearly and Check Spelling**

**INSTRUCTIONS**

Complete all blanks applicable to this installation. This application must be accompanied by a detailed legible drawing of all the components pertaining to the Direct Ship. Use the numbers below and the numbers from the “Application for Milk Handling Equipment and Facility Construction” F-fd-31 to identify all components.

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Cooling Media Sample Port</td>
</tr>
<tr>
<td>22</td>
<td>Tanker Valve Drip Pan</td>
</tr>
<tr>
<td>23</td>
<td>Indicating Thermometer</td>
</tr>
<tr>
<td>24</td>
<td>Recording Thermometer Probe</td>
</tr>
<tr>
<td>25</td>
<td>Recording Device</td>
</tr>
<tr>
<td>26</td>
<td>Tanker Dock Seal(s)</td>
</tr>
<tr>
<td>27</td>
<td>Sanitizing Station</td>
</tr>
<tr>
<td>28</td>
<td>Check Valve(s)</td>
</tr>
<tr>
<td>29</td>
<td>Milk Transfer Hose(s)</td>
</tr>
<tr>
<td>30</td>
<td>Drip Sampler</td>
</tr>
<tr>
<td>31</td>
<td>Milk Line Air Blow Fitting</td>
</tr>
<tr>
<td>32</td>
<td>Hard Surfaced Tanker Pad</td>
</tr>
</tbody>
</table>

**PART I - EXTERIOR CONDITIONS**

- **Tanker Parking Surface**
  - [ ] Concrete
  - [ ] Asphalt
  - [ ] Other

- **Extends Under Full Length Of Tanker**
  - [ ] Yes
  - [ ] No Explain:

- **Surface Sloped to Drain**
  - [ ] Yes
  - [ ] No Explain:

- **Tanker Connection to Milkhouse**
  - [ ] Dock Seal
  - [ ] Hose Port
  - [ ] Enclosed Intake
  - [ ] Other Explain:

**PART J - TANKERS(s)**

- **Direct Tanker Equipment Installation**
  - [ ] Over the Road
  - [ ] Hose Cabinet

- **Who Owns the Milk Tanker(s)**
  - [ ] Dairy Plant
  - [ ] Producer
  - [ ] Hauler

- **Provide Milk Tanker License Numbers(s)**
  
<table>
<thead>
<tr>
<th>Number</th>
<th>License Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

- **Tankers(s) Meet 3A Sanitary Construction Standards**
  - [ ] Yes
  - [ ] No

- **Tanker Modified to Fit Tight To Milkhouse**
  - [ ] Yes
  - [ ] No

- **Tanker Access Ports Sealable**
  - [ ] Yes
  - [ ] No

*Continue on Reverse Side*
PART K - INTERMEDIATE COOLING

Milk Cooling Method
☐ Heat Exchanger  ☐ Bulk Tank
Provide All Pertinent Information in Section E of Application for Milk Handling Equipment and Facility Construction F-fd 31

Temperature Monitoring
☐ Chart  ☐ Electronic
Enclose copy of the chart or chart specifications.

PART L - FARM PROCEDURES

How Many Milkings to Fill Tanker
______ hrs. How Long Will Tanker Remain On Farm

Where Is the Point Of Sale for the Milk
☐ The Farm  ☐ The Dairy Plant

Is the Milking System Cleaned After Every Use
☐ Yes  ☐ No

Transfer Hose, Check Valve, Exposed Interior Portion of Tanker Valve, Washed & Sanitized After Each Milking
☐ Yes  ☐ No

Hoses and Fittings of Sanitary Design for Clean in Place, No Barbed Fittings with Hose Clamps.

PART M – WEIGHING & SAMPLING OF THE MILK

Performed By a Licensed Weigher & Sampler
☐ Yes  ☐ No

Department Approved Facility for Receipt of Direct Shipped Tankers
☐ Yes  ☐ No

Milk Agitation Location
☐ Tanker  ☐ Storage/Silo (May Not Be Commingled With Other Milk)

Method of Milk Agitation
☐ Mechanical  ☐ Air  ☐ Other

Location of Official Sampling
☐ Farm  ☐ Dairy Plant

Type of Official Sampling
☐ Tanker  ☐ Storage Tank  ☐ Drip Sampler

Length of Agitation Prior To Sampling
______ MINUTES

Agitation Protocol Established in Compliance with Standard Methods for the Examination of Dairy Products, Section 3.042 B. Test results on file at the receiving Dairy Plant.

Below is an example drawing of a Direct Ship operation added to an existing milking operation.
Direct Tanker Shipping Requirements

Definition: The only classification for direct shipment of milk is when a tanker is directly attached to the milkhouse. Any time a tanker is located away from the milkhouse it is not a direct ship farm. This includes one-time loading of milk. This type of shipment is a standard farm pick-up with a bulk transport tanker, all sampling is done on the farm from a bulk tank by a licensed BMWS. Refer to ATCP 65.16 for additional bulk tank transport container requirements.

Plan Review
1) Facility and equipment comply with ATCP 65, 3A Standards, and this policy.
2) Submit the following forms to the Department prior to installation or modification:
   • Application for Milk Handling Equipment and Facility Installation (F-Fd-31)
   • Supplemental Application for Direct Tanker Milking Operations (F-Fd-258)

Construction
1) Tanker shall be parked on a pad of concrete or equally impervious material.
2) Parking surface shall extend from the milkhouse and under the front feet of the tanker.
3) Parking surface shall be sloped to drain and kept clean.
4) All permanent pipelines end in the milkhouse.
5) A protected opening (dock seal) into the milkhouse shall be provided or an enclosed intake meeting milkhouse requirements.
   • Provide a tight-fitting dock seal connection to prevent the entrance of insects and other pests. Dock seal shall be constructed of non-absorbent washable material and be properly sized to facilitate access to the tanker outlet valve.

Tankers
1) Shall meet 3A Standards for construction and are permitted (as applicable).
   • Air or mechanical agitation modifications to the tanker must meet sanitary standards.
   • Tanker exterior modifications to fit the dock seal must meet sanitary standards.
2) Outlet valve is close coupled and protected with an effective dust cover or be located within a pump/hose cabinet.
3) Have an access port that can be sealed. Access ports are sealed by the dairy plant after washing and shall remain sealed until received at the plant for sampling and unloading.

Cooling
1) Meets cooling requirements listed in ATCP 65.18(4) and 3A Standards.
2) Cool all milk to 45°F or lower before the milk enters the tanker.
3) Install an appropriate recording thermometer.
   • Plate or tube heat exchanger: recording thermometer probe shall be mounted in a well in the milkline downstream of the heat exchanger.
   • Bulk tank: recording thermometer probe may be mounted in the bulk tank.
4) Recirculating water system 65.10(6). Originates from a safe source that meets microbiological standards, is protected from contamination, the coolant is non-toxic or pharmaceutical grade propylene glycol meeting 21 CFR 184.1666, and does not contain coliform bacteria.

5) Field Rep tests cooling media for coliform bacteria every six months and test results are available for inspection.

6) Bulk milk cooling device and transport hose shall be cleaned between milkings or at least once every 24 hours if continuously milking.

**Indicating Thermometer**

1) Installed as close as possible to the temperature recording device, to verify recording temperatures.
2) Installed in a sanitary manner, no threads in contact with milk.
3) A digital display of the chart recorder or other similarly accurate temperature device is acceptable for conducting this accuracy verification.
4) Thermometers must be verified for accuracy within ± 2°F every six months by the dairy plant field representative and properly documented in a log or on the chart.

**Temperature Recording Device**

1) Comply with ATCP 65.16(3), Wis. Adm. Code and 3A Standards.
2) Chart span of not less than 50°F, including normal storage temperature ± 5°F.
3) Chart graduated in not more than 2°F divisions, spaced not less than 1 mm apart at temperatures below 100°F.
4) Charts shall be capable of recording temperatures up to 180°F.
5) Charts have at least one time span division per hour.
6) Chart makes one revolution in not more than 7 days, graduated for a max. record of 7 days.
7) Strip charts move not less than 1 inch per hour and may be used continuously for 1 month.

**Electronic Records**

- Shall have easily understood temperature graduations and time span identification, electronic records are maintained for at least 6 months and the temperature recording device must be verified for accuracy within ± 2°F every six months by the dairy plant field representative and properly documented. A written procedure shall be available for a Division representative to use to properly review the records. The written procedure shall be acceptable to the division and shall meet the requirements of the PMO Appendix H., IV. Temperature-Recording Devices Used in Storage Tanks and V., Criteria 4, 7, 8, 9, 11 and 12 and available to a division representative upon request.

**Farm Procedures**

1) Unlimited milking periods to fill the tanker.
   - ATCP 82.10 requires that if milk from a grade A/B dairy farm violates an applicable standard under ATCP 65.70 on any single test, milk from that farm shall be collected at least once every 2 days until a subsequent test shows the milk from that farm no longer
violates the standard. FDA recommends that storage of milk in a transport tank on the farm should not exceed 72 hours.

2) Hose attachment
   • Milk transfer hose attached within the milkhouse.
   • Sanitary drip pan shall be under the outlet valve to capture spilled milk and sanitizing solutions and drain them back into the milkhouse.
   • Sanitize the tanker outlet valve and hose connections prior to connecting the milk transfer line.
   • Store all pipeline and hose caps in the milkhouse during milking operations.
   • Provide a sanitary and seamless milk transfer hose intended for CIP cleaning (no hose clamps).
   • Transfer hose stored to drain with open ends protected from contamination.

3) Point of Sale Ownership Clarification
   • Point of sale takes place when the tanker arrives at the dairy plant.
   • Regardless of point of sale issues, all milk that has confirmed positive for drug residue shall be removed from the human food chain, disposed of and immediately reported to the department. The plant shall maintain a disposal record for each affected tanker. A positive drug residue investigation shall be conducted on all positive loads.

Weighing and Sampling

Dairy Plant
1) Sampled by a licensed BMWS from a properly agitated tanker located in a suitable facility.
   • BMWS shall collect the sample using a method approved by the department or a sample dipper that is of sanitary design and construction, is clean, and in good repair.
2) Sampled by a licensed BMWS from a properly agitated storage tank or silo prior to commingling.
   • Sample via a properly located and approved sampling valve.
3) A division approved in-line milk sampling device.
   • Submit a specific protocol for the sampling device to the division for review and acceptance prior to installation.
4) Screen all tanker loads for drug residue before unloading or commingling with other milk.
5) Record the temperature of each delivery of milk.
6) Annotate the weight collection record with the milk delivery temperature.

On the Farm
1) Sampling of tanker by a licensed BMWS from a properly agitated tanker located in a suitable shelter adjacent to, but not inside the milkhouse.
   • Suitable shelter meets milkhouse construction requirements.
2) A division approved in-line milk sampling device installed on the milk pipeline system.
   • Acceptable for both drug residue screening and quality tests.
   • Submit a specific protocol for the sampling device to the division for review and acceptance prior to installation. **Note**: The producer may use a sanitary in-line milk sampling device that does not meet the division’s acceptance criteria for milk quality sampling to collect a sample for an unofficial drug residue screening. Any unapproved
in-line sampling method is unacceptable for official drug screening or milk quality testing.

**Agitation Methods**

1) Agitation method ensures a homogeneous product.
   - Establish an agitation protocol in compliance with Standard Methods for the Examination of Dairy Products, Section 3.042 B.
   - Receiving facility maintains a copy of agitation protocol and it is available to the department upon request.

**Weighing Methods**

1) Establish a weighing method that meets the criteria outlined in ATCP 92, Wis. Adm. Code, (Weights and Measures).
2) Return a duplicate copy of the weight collection record to the farm for posting in the milkhouse and available for inspection.
Supplemental Application for Automatic Milking Installation (AMI)

Wis. Stats. s.97.22, s. ATCP 65.14(6)

When submitting the F-fd-31 Milking Equipment Installation Application, please include this form and the four supporting documents listed below:

1. Layout Plan
2. Teat Prep Protocol – FDA Approved
3. Block-Bleed-Block Valve Testing Protocol
4. Abnormal Milk Detection Verification Procedure

PRODUCER NAME: 
CITY, STATE: 
DATE: 
AMI MANUFACTURER: 
NUMBER OF AMIs: 

This application allows the filer to explain how the proposed installation complies with Appendix Q of the Grade "A" PMO and current Department rules. Please attach plans showing locations of AMIs, plumbing devices, milk storage, ventilation, lighting and milk handling equipment along with operator and livestock traffic flow. Attach diagrams and testing procedures of all product and CIP isolation valves.

Note: for additional information refer to the Appendix Q of the PMO; the numbering of this application corresponds to Appendix Q. Future modifications to the AMI milking system or the addition of one or more AMIs require resubmission of this application.

Please note any unique items, design functions or procedures used in this installation, such as underground subway, reclaim water system, etc.

ITEM 1. ABNORMAL MILK
Describe the method of separating milk from animals producing milk with abnormalities or animals treated with antibiotics. Refer to Item 14 for proper separation of milking equipment in contact with abnormal or antibiotic treated milk and Items 10 and 11 for cleaning and sanitizing milking equipment following contact with abnormal or antibiotic treated milk. Describe the method(s) of abnormal milk detection and exclusion. Please identify the location of abnormal milk storage, if used.

ITEM 2. MILKING BARN, STABLE OR PARLOR – CLEANLINESS
Provide a wall, floor, ceiling cleaning schedule for the AMI milking room. Describe the method of clean access for inspection and maintenance personnel. If access to the AMI room requires personnel to walk through animal traffic/housing areas, a method to clean footwear shall be provided and described. Explain method(s) provided at the AMI room.
### ITEM 3. MILKING BARN, STABLE OR PARLOR – CLEANLINESS
Describe the method and frequency for cleaning the AMI milker box and surrounding area.
Describe the Automatic Cow Platform wash frequency and water source if applicable.

### ITEM 9. UTENSILS AND EQUIPMENT – CONSTRUCTION
Provide documentation on any prototype equipment used for the AMI. All milking equipment shall meet sanitary construction in respect to fit and finish. Indicate whether any AMI components are manually washed in the AMI milker box.
Indicate where the in-line milk filter is located.

### ITEMS 10 & 11. UTENSILS AND EQUIPMENT – CLEANING AND SANITIZATION
Provide the cleaning method for the AMI following abnormal milk detection. Provide the method and cleaning/sanitization frequency of the AMI, main milk lines, supporting equipment (buffer tank, receive-all, etc.) and bulk milk tank.

### ITEM 12. UTENSILS AND EQUIPMENT – STORAGE
Provide documentation of the AMI positive air ventilation system, to include air source, air filtration (if any) and ventilation system operating criteria. Provide information on the type of flooring used in the cattle staging area, i.e., slotted floor over manure, solid concrete floor. Explain how the milk lines from the AMI to milk storage are supported.
ITEM 13. MILKING - FLANKS, UDDERS AND TEATS
Provide documentation of the National Conference on Interstate Milk Shipments (NCIMS) M-I Memorandum of acceptance for the teat prepping system. Describe your after milking Post Dip system if used.
Describe the AMI flush/rinse cycle of the inflations between the milking of normal cows, if applicable.

ITEM 14. PROTECTION FROM CONTAMINATION
Provide information describing the separation between: 1) Cleaning/sanitizing solutions and milk intended for sale, and 2) Milk with abnormalities and milk intended for sale. Provide the valve documentation and testing protocols for all inter-wired block-bleed-block fail-safe valve systems.

ITEM 18. RAW MILK COOLING
For AMIs the raw milk must be cooled following current standards. Explain the milk cooling and storage process. Check applicable equipment used in this system and show location on the plan layout.

- Buffer Tank
- Single Milk Filter
- Bulk Milk Tank(s)
- Temperature Recording Device
- Receive-All
- Multiple Milk Filters
- Bulk Milk Tank Load Out Pump
- Plate Heat Exchanger
- CIP Pump
- Direct Ship Tanker(s)

Personal information you provide may be used for purposes other than that for which it was originally collected s. 15.04(1)(m), Wis. Stats.
Verification Testing for Automatic Milking Installation Commissioning

Please type or print. E-mail completed submission form to:
The assigned Dairy Technical Specialist OR E-mail to DATCPDFSPlanReview@wisconsin.gov

<table>
<thead>
<tr>
<th>PRODUCER NAME:</th>
<th>□ GRADE A □ GRADE B</th>
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</table>

<table>
<thead>
<tr>
<th>PRODUCER PHYSICAL LOCATION:</th>
<th>CITY:</th>
<th>STATE:</th>
<th>ZIP CODE:</th>
</tr>
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<table>
<thead>
<tr>
<th>PRODUCER EMAIL:</th>
<th>TELEPHONE: (   ) -</th>
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<table>
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<th>LEGAL NAME OF INSTALLATION COMPANY:</th>
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<table>
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<th>STATE:</th>
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<table>
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### Submission Requirements:

Pursuant to Wis. Admin. Code § ATCP 65.14(5)c, and the 2019 PMO, Appendix H, this form documents verification of the computerized programming controls as performed by the installer or the AMI Manufacturer.

- The fail-safe valve system(s) provides separation between cleaning/sanitizing solutions and milk intended for sale, and thus functions as specified by the manufacturer’s test procedure.
- The fail-safe valve system(s) provides separation between milk with abnormalities and milk intended for sale, and milk quality sampling devices are properly separated as specified in the manufacturer’s test procedure.
- The fail-safe valve system(s) properly detects and diverts abnormal milk and cleans and sanitizes milk contact surfaces as specified in the manufacturer’s test procedures.
- The teat prep process is applied in accordance with the FDA approved teat prep protocol.
- Copies of the following documents are present on the farm for regulatory review:
  - Fail-safe valve system valve testing protocol
  - Teat Prep Protocol
  - Abnormal Milk Detection Verification Procedures
  - Copies of the most recent verification testing with installer technician signature (a copy of this signed document).
  - Written procedure for verifying the effectiveness of the computer software and hardware.

Disclosure: With this submission, I certify completion of the verification procedures listed above. I certify that the information is accurate and fully represents the verification testing outcome of this AMI installation.

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This section is for WDATCP use only.

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SUBJECT: Guidance for use of F-fd-45, Verification Testing for Automatic Milking Installation Commissioning

Scope

The purpose of this document is to provide guidance to the dairy industry, specifically Automatic Milking Installation (AMI) installers and/or manufacturers working to complete the DATCP form F-fd-45, Verification Testing for Automatic Milking Installation Commissioning following the installation and verification testing of an AMI unit(s).

Definitions

- DATCP – Wisconsin Department of Agriculture, Trade and Consumer Protection
- AMI – Automatic Milking Installation
- DBA – Doing Business As
- DTS – Dairy Technical Specialist
- Lead technician – An employee of the installation company who oversees the equipment design, facility construction/layout and installation of the AMI unit(s).
- Verifying individual – An employee of the installation company who physically conducts the onsite verification testing.

Guidance

1. Complete the Producer Contact Information portion of the form. This shall include providing all of the following:
   a. The producer’s first and last name.
   b. The DBA or Legal name of the producer’s farm/business.
   c. The physical address of the farm/business location where the AMI unit is installed.
      - This includes the city, state and zip code.
   d. The current or intended permit or license status of the milk producer – Grade A or Grade B.
   e. The producer’s email address.
   f. The producer’s phone number.
2. Complete the Installer’s Contact Information portion of the form. This shall include providing all of the following:
   a. The legal name of the company installing the AMI unit(s).
   b. The installer’s mailing address.
      • This includes city, state and zip code.
   c. The lead technician’s first and last name who is overseeing the AMI installation.
      • Include lead technician’s position title (ex. Lead Supervisor, Foreman, Lead Engineer).
   d. The lead technician’s email address.
   e. The lead technician’s phone number.

3. Complete the remaining portion of the form which details information specific to the AMI unit(s) and the verification activities. This shall include providing all of the following:
   a. The first and last name of the individual conducting the verification testing activity.
   b. The date(s) the verification testing was completed.
   c. Identifying the type of work completed, new installation or a modification to a unit(s) currently in service. For a retrofit of a used AMI unit(s) please indicate new installation.
   d. The name of the AMI unit(s) manufacturer.
   e. The number of AMI unit(s) being installed at this farm.
   f. Within the remaining checklist (10 items) you will find a statement with a correlating checkbox.
      • If a box is checked, this indicates that the correlating statement is true.
        Example 1 – If the testing of the fail-safe valve system (block-bleed-block valves) provides separation between cleaning/sanitizing solution and milk according to the manufacturer’s procedures, the correlating box shall be checked.
      • Example 2 – If the box is not checked, this indicates the correlating statement is not true or that it was not completed. This results in the assigned DTS marking the “Accepted Results” box as NO and the producer would not be allowed to begin or continue production.

4. Once all of the necessary information has been provided in the sections described above, the form is signed and dated by the individual taking responsibility for the accuracy of the verification testing in conformance with the manufacturer’s testing procedures. An electronic signature is sufficient.

5. Email the completed form to DATCPDFSPlanReview@wisconsin.gov.

Contacts

- Dairy Technical Specialist Team
  - DATCPTechnicalSpecialists@wisconsin.gov
• DATCP Dairy Services Office – Eau Claire, WI
  o DATCPedairy@wisconsin.gov

References

• ATCP 65.14(6)a-c – Review of Plans – language specific to the necessity for farm plan reviews and the responsibility of the department to respond.
• ATCP 65.14(5)(c)1-6 – Milking Equipment – language specific to the installation of AMI units.

Document History

The most recent changes to this controlled document are listed at the top of the table:

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Approval

4/8/2021 12:23 PM Task Completed □ Stoner, Steve K  Task assigned to Stoner, Steve K was approved by Stoner, Steve K. Comments: Approved by Stoner, Steve K
4/8/2021 12:23 PM Task Completed □ Koss, Rebekah K  Task created for Anderson, Timothy P. Due by: 4/9/2021 12:00:00 AM
4/8/2021 12:23 PM Task Completed □ Anderson, Timothy P  Task assigned to Anderson, Timothy P was approved by Anderson, Timothy P. Comments: Approved by Anderson, Timothy P
4/8/2021 12:23 PM Task Completed □ Koss, Rebekah K  Task created for Sprecker, Troy S. Due by: 4/9/2021 12:00:00 AM
4/9/2021 10:52 AM Task Completed □ Sprecker, Troy S  Task assigned to Sprecker, Troy S was approved by Sprecker, Troy S. Comments: please just use DATCP vs. WDATCP. Approved by Sprecker, Troy S
Milkhouse Construction Requirements

Ref: Chapter ATCP 65, Wisconsin Administrative Code

1. Floors shall be of concrete or other equally impervious materials and be sloped for proper drainage to a floor drain (¼ inch per foot slope is recommended).

2. Floor drains shall not be under the bulk tank and shall be readily accessible. Floor drains shall be trapped if connected to a sanitary sewer system. Trench drains are acceptable under bulk tanks if the actual drain is not directly under the outlet valve and is accessible for maintenance.

3. Milkhouse drain and CIP pre-rinse water must be piped into a waste handling system and may not run through gutters in the barn or parlor areas. Properly treated wash and rinse waters from CIP systems may be used for floor rinsing of parlors. Please contact the Department for more information about the use of reclaimed water on farms.

4. Waste from human waste and septage must be disposed of in a sanitary sewer system or by other methods that comply with ATCP 65.22(6).

5. Plumbing in the milkhouse should meet the requirements of the state Plumbing Code. Cleaning solutions should be discharged directly into the waste system and not across concrete floors. There shall be no cross-connections or submerged inlets.

6. All milkhouse doors shall be self-closing and tight fitting. If the milk house opens directly into the barn, the door shall be solid. Screen doors on outside openings shall open outward.

7. Adequate ventilation shall be provided to prevent excessive odors and visible condensation on any milkhouse surfaces. Ventilators shall not be located directly above bulk tank openings. Windows shall be effectively screened. Air supplied to the milkhouse must be from outdoors or from other rooms that are clean and free of odors. Vents located between the milkhouse and the parlor, barn, or cattle housing areas shall be provided with a fan that exhausts the milkhouse air and vent louvers that close tightly after the fan stops. Forced air heating systems shall not blow air from milking or animal housing areas into the milkhouse.

8. There shall be at least 30 foot–candles of illumination in all working areas of the milkhouse. Artificial lights located over a bulk tank shall be shatterproof, or effectively shielded to protect milk from contamination from broken glass.

9. Adequate clearance shall be maintained on the top along the sides of the bulk tank to facilitate proper weighing, sampling, inspection and cleaning.
10. A hose port is required if a bulk tank is used and shall be installed in an outside wall at least six inches above the floor. A paved surface of concrete or other cleanable material shall be installed adjacent to the outside wall under the hose port. The minimum size of the paved surface is 4 ft. by 4 ft.

11. Milkhouse walls and ceiling shall be constructed and finished so that they are impervious to water, light colored and easily washable.

12. Milkhouse shall be large enough to accommodate all necessary equipment.

13. Milkhouse shall be equipped with a fixed handwashing facility which is separate from the wash and rinse vat. The handwashing facility shall be served by potable hot and cold running water from a faucet or faucets located directly over the facility. Water shall enter and leave the handwashing facility by means which preclude splash. Soap and single service sanitary towels or another approved means of drying hands shall be available at all times for use at the handwashing facility. A handwashing facility may be located in a room immediately adjacent to the milkhouse, provided that it is readily accessible from the milkhouse. This paragraph applies to an AMI room in which the operator’s hands will contact milk filters or other milk contact surfaces.

14. Wells are to comply with applicable DNR administrative codes NR 810, Requirements for the Operations and Maintenance of Public Water Systems; NR 811, Requirements for the Operation and Design of Community Water Systems; NR 812, Well Construction and Pump Installation.

15. A two compartment wash vat is required. It shall be supplied with potable hot and cold running water from a faucet located directly over the wash vats. A CIP wash vat can be used to meet the requirement for one of these vats as long as it has no brackets that would restrict its use. The milking units must be stored properly while the CIP vat is being used for the manual cleaning of equipment.

16. Water heating capacity shall be adequate for all milkhouse operations. The producer or installer shall determine the water heating capacity needed. Guidance for sizing water heating systems can be obtained from The Dairy Practices Council publication number 58; "Guidelines For Sizing Dairy Farm Water Heater Systems" or from a milking equipment installer. Alternative hot water heating systems (such as tankless water heaters) may be authorized if the proposed system can provide an adequate supply of hot water for cleaning. A detailed report must be submitted to the Department for review.

Order From: The Dairy Practices Council 19 Titus Court, Richboro, PA 18954, Telephone/Fax: (215) 355-5133 or online at www.dairypc.org.

17. Access to the milkhouse by driveway and every exterior access door shall be located in such a way that no vehicle or person traveling to the milkhouse must pass through and animal walk way, holding area, or yard where excessive animal waste may accumulate.

This institution is an equal opportunity provider.
Bulk Tank Installation Requirements

ATCP 65.14 Milking and milk handling systems

(6) Review of Plans
(a) Before installing, reconstructing or extensively altering a bulk tank, milking system, milk handling system, milk house, milking parlor, or dairy farm water supply system, the installer shall on behalf of the milk producer submit plans to the department for review. The department may charge a fee under s. 93.06 (1w), Stats., to cover its cost of providing the review service. The department shall return the plans together with any comments or objectives within 14 days after the plans are received by the department. No review is required for a portable transfer receptacle or its appurtenances.
(b) No manufacturer or distributor of milking or milk handling systems may sell, or distribute for sale in this state, any portion of a milking or milk handling system unless specifications or prototype equipment are first reviewed by the department. Within 30 days after specifications or prototype equipment are received by the department, the department shall return them with any comments or objections. The department may require field testing of the equipment prior to sale if the department finds that field testing is necessary to determine whether the requirements of this section are met. Field testing shall be conducted under conditions prescribed by the department.
(c) Plans and specifications submitted under this subsection shall be sufficiently detailed to permit reasonable review by the department within the time periods specified under this subsection.

(7) Certification of Compliance by Installer. A person who installs, reconstructs or extensively alters a bulk tank, milking system, milk handling system, milk house, milking parlor, or dairy farm water supply system shall certify to the owner of the system that the system has been installed or modified in compliance with this section, and in compliance with the plans filed with the department under sub. (6)(a). The installer, immediately after installing or modifying the systems, shall provide to the milk producer and the department a signed written statement certifying compliance. The milk producer shall post a copy of the certificate in the milk house for at least 12 months.

ATCP 65.16 Bulk tanks and bulk transport containers.

(1) Bulk Tank Location. If a bulk tank is used to receive, cool or store milk on a dairy farm, the bulk tank shall be installed in the milkhouse. A bulk tank may be installed so that a portion of the bulk tank protrudes through the wall of a milkhouse, provided that all bulk tank openings are located inside the milkhouse. Agitator seals, other than weatherproof agitator seals approved in writing by the department, shall be located inside the milkhouse. Adequate clearance shall be maintained on the top and all sides of a bulk tank to permit effective cleaning, sanitizing and maintenance of the bulk tank. No bulk tank opening may be located directly under a ventilator. No bulk tank may be located directly over a floor drain.
Note: Clearance of at least 24 inches on the top and the milk outlet side of the bulk tank, and 18 inches on all other sides of the bulk tank, are adequate to comply with this subsection. No clearance is required for that portion of a bulk tank which protrudes through the wall of a milkhouse.

(2) Bulk Tank Construction.

(a) The lining and milk contact surfaces of a bulk tank shall be constructed of stainless steel or other materials which are equally smooth, nontoxic, stable, non-absorbent, corrosion resistant, and capable of withstanding cleaning and sanitizing treatment. Milk contact surfaces shall be readily accessible for inspection.

(b) A bulk tank shall be self-draining. Openings shall be equipped with self-draining covers. Opening and covers shall be constructed and installed to prevent drainage into milk, or onto milk contact surfaces.

(c) A bulk tank shall be equipped with all of the following:
   1. An indicating thermometer that has a range of at least 32°F to 80°F.
   2. A temperature recording device approved by the division, if the bulk tank is manufactured after January 1, 2000. The temperature recording device shall comply with sub. (2m).

(d) A bulk tank with a capacity of less than 1,500 gallons shall be equipped with a mechanical agitator which will ensure homogeneity of all milk contained in the bulk tank within 5 minutes after the agitator begins operating. A bulk tank with a capacity of 1,500 gallons or more shall be equipped with an agitator which will ensure homogeneity of all milk contained in the bulk tank within 10 minutes after the agitator begins operating.

(e) A C-I-P bulk tank shall be designed and constructed so that cleaning, rinsing, and sanitizing solutions cannot enter the bulk tank while it contains milk.

Note: Bulk tanks manufactured in compliance with the "3-A Sanitary Standards for Farm Milk Cooling and Holding Tanks" meet the sanitary design and construction requirements of this subsection. The "3-A Standards" are published by 3-A Sanitary Standards, Inc., 6888 Elm Street, Suite 2D, McLean, VA 22101-3850, telephone (703) 790-0295, website www.3-a.org. Copies of the "3-A Standards" as amended effective July 23, 2012, are on file with the division and the legislative reference bureau. Copies may be obtained from "3-A Sanitary Standards, Inc., Online Store," at http://www.techstreet.com.

(3) Bulk Tank Temperature Recording Device.

All of the following requirements apply to a temperature recording device under sub. (2) (c) 2.: (a) The temperature recording device shall be capable of accurately recording temperatures between 40°F (4°C) and 180°F (82°C).

(b) A temperature recording chart on which the temperature recording device records milk temperatures shall have graduations of not more than 2°F (1°C) at temperatures below 100°F (38°C) and shall have at least one time span division per hour. The circular chart shall make one revolution in not more than 7 days and shall be graduated for a maximum record of 7 days.

(c) The milk producer shall retain milk temperature records for at least 6 months after the temperature recording device makes those records. Milk temperature records shall identify the milk producer, the date or dates to which the records pertain, the bulk tank to which the
records pertain if there is more than one bulk tank on the dairy farm, the signature of the person who removed the temperature records from the temperature recording device, and any unusual occurrences related to milk temperature.

(e) A milk producer keeping electronic records in conformance with par. (b), (c) and (d) shall develop a written procedure for a division representative to use to review the records. The written procedure shall be acceptable to the division and made available to a division representative upon request.

(4) Bulk Tank Cooling Capacity. A bulk milk tank shall be capable of cooling all milk placed in the tank to 50°F. (10°C.) or less within 4 hours after the start of the first milking, and to 45°F. (7°C) or less within 2 hours after the end of milking. The temperature of the blended milk from the first milking and later milkings shall not exceed 50°F. (10°C.).
DAIRY FARM PRE-COOLER REQUIREMENTS

ALL PRE-COOLERS-GENERAL REQUIREMENTS
1. A plan shall be submitted to and reviewed before installing a pre-cooler.
2. The installation shall comply with 3-A 606-05 and Ch. ATCP 65 Wisconsin Administrative Code.
3. Pre-coolers shall drain completely; provide automatic drains where needed. Multiple pass coolers shall be designed to allow drainage of all the passes that can trap water.
4. Make pre-coolers easy to access for inspection and cleaning. Provide any tools needed for disassembly near the cooler.
5. Single use cooling water sources shall comply with ATCP 65.10 Wis. Adm. Code.
6. Recirculated coolant shall be tested and found safe every 6 months.
7. Glycol coolant shall be food or pharmaceutical grade.
8. Recirculated coolant systems shall protect the coolant from contamination.
9. Provide a sampling valve on recirculated cooling systems.
10. Provide a drip deflector on the swing pipe if it fills through the top of the bulk tank.
11. Locate pre-coolers in a proper area, not in milking barns or animal housing areas. Acceptable locations include the milkhouse, milking parlor, or a mini-milkhouse. Installation in a utility room may be accepted if the utility room meets the mini-milkhouse construction requirements (see Wisconsin Requirements for Mini-Milkhouse/Pumphouse F-fd-35).
12. For plumbing requirements, see next page.

PLATE PRE-COOLERS-ADDITIONAL REQUIREMENTS
1. Plate pre-coolers shall comply with 3-A Standard 11-09.
2. Plate pre-coolers installed after November 1990 are required to have end plate bolt cutouts.
3. Mount plate pre-coolers a sufficient distance from the wall with unobstructed access to the moveable end plate.
4. Provide easy to disassemble connections on the end plates.
5. Plate pre-coolers shall allow opening to the width of one plate or 15 inches, whichever is less.
6. Ceiling mounted units shall be easy to take down for inspection.
7. Provide a milk filter between the receiver jar and pre-cooler. Change filters prior to milking and prior to CIP.
8. For plumbing requirements, see next page.

TUBE IN SHELL COOLERS- ADDITIONAL REQUIREMENTS
Tube in shell pre-coolers shall comply with 3-A Standard 12-07.
For plumbing requirements, see next page.

CUBE TYPE COOLERS AND RECEIVER JAR COOLERS - ADDITIONAL REQUIREMENTS
For plumbing requirements, see next page.
PLUMBING REQUIREMENTS FOR ALL PRE-COOlERS

1. If there are no valves in the discharge line from the pre-cooler, back flow prevention is not required.
2. If there is a valve in the line downstream from the pre-cooler, back flow prevention is required on the water supply line.
3. The pre-cooler discharge line shall have no submerged inlets or cross connections to other water lines, regardless of any back flow prevention in the water supply line.
4. If the pre-cooler discharge has submerged inlets, backflow prevention is required on both the water supply line and the discharge line.

Acceptable Plumbing-Outlet Line Not Under Pressure

- Safe Water Supply
- Plate Cooler
- Optional Bypass Pipe
- Outlet Pipe
  - No Valves
  - No Floats
  - No Drinking Cups
- No Cross Connections To Potable Lines
- No Submerged Inlets

Note: Valves may be located in the water supply and bypass lines.

Acceptable Plumbing-Outlet Pressurized

- Safe Water Supply
- Plate Cooler
- Optional Bypass Pipe
- Outlet Pipe Having Valves, Floats, Or Drinking Cups
- No Cross Connections To Potable Lines
- No Submerged Inlets

Note: Valves may be located in the water supply and bypass lines.
WATER RECLAIMED FROM HEAT EXCHANGER PROCESSES

Potable water utilized for heat exchange purposes in plate or other type heat exchangers or compressors on dairy farms may be salvaged for the milking operation if the following criteria are met. Note: Reclaimed water for milking operations is defined as any equipment or personnel cleaning operations, hot water production, CIP make-up, or any water use that may contact milking equipment. Submit a plan to Department for review prior installing a reclaimed water system.

1) The water shall be stored in a storage vessel properly constructed of such material that it will not contaminate the water supply and be designed to protect the water supply from possible contamination.
   - Acceptable materials include those normally found in water distribution systems that also allow the system to be effectively cleaned if contamination of the system occurs.
   - Protection of the water supply in the tank includes the use of tight fitting or overlapping covers, placement of the tank in an environment that will not affect the integrity of the tank and protects the water supply from any potential source of contamination.
   - The storage vessel shall be equipped with a drain and access point to allow for cleaning.

2) The outlet of the plate cooler is properly isolated from the storage tank and must not reconnect with the potable water distribution system.

3) No cross-connection shall exist between this supply and any unsafe or questionable water supply or any other source of contamination.

4) There are no submerged inlets through which this supply may be contaminated.

5) The water shall be of satisfactory organoleptic quality and shall have no off flavors or odors.

6) The water shall be bacteriologically safe per NR 809.30. Test results shall be kept at the farm for review.
   - The dairy plant operator shall collect and analyze the reclaimed water system prior to initial approval and semi-annually thereafter. See below for the testing criteria.

7) Approved chemicals, such as chlorine, with a suitable retention period, may be used to suppress the development of bacterial growth and prevent the development of tastes and odors.
   - When chemicals are added, a monitoring program for the added chemicals shall be maintained.
   - Additionally, the chemical addition process shall not add substances that will prove deleterious to the use of the water or contribute to product contamination.

8) If the water is to be used for the sanitizing of teats, equipment, utensils, or backflush systems, approved sanitizers shall be used. Approved sanitizers may be added by an automatic proportioning device located downstream from the storage vessel but prior to end-use application.
   - Suitable backflow protection is required prior to the addition of chemical.

OR

Water obtained directly from the discharge of a raw milk heat exchanger during a milking may be used once to pre-rinse dairy equipment including lines, milking claw assemblies and milk receivers if all the following apply.
   - Collect the water directly from the plate heat exchanger into the wash vat or utensil sink.
   - There is no submerged inlet between the plate heat exchanger discharge and the wash vat or utensil sink
   - Discharge the pre-rinse water to waste immediately following use.

WATER RECLAIMED FROM HEAT EXCHANGER PROCESSES FOR NON-POTABLE USE

Water may be reclaimed from plate heat exchangers on dairy farms and used for parlor floor wash down, manure pan flushing, holding area flushing, cattle watering and other non-potable uses without further testing. The outlet of the heat exchanger must be protected from backflow and must not reconnect with the potable water distribution system.
**Application:** To private water, recirculated cooling water, reclaimed water in dairy farms. Frequency: Initially, after repair, modification or disinfection of a private water supply of dairy farms and every 2 years thereafter; and initially, following repair, modification or disinfection of recirculated cooling water and reclaimed water on dairy farms and semiannually thereafter.

**Criteria:**
- A MPN (Most Probable Number of coliform organisms) of less than 1.1 per 100 ml, when ten replicate tubes containing 10 ml, or when five replicate tubes containing 20 ml, are tested using the multiple tube fermentation technique.

  OR

- A MPN (Most Probable Number of coliform organisms) of less than 1 per 100 ml by the membrane filter technique,

  OR

- A MPN (Most Probable Number of coliform organisms) of less than 1.1 per 100 ml when using a MMO-MUG technique. Note: The MMO-MUG technique is not acceptable for recirculated cooling water).

**Apparatus, Method, and Procedure:** Tests performed shall conform to the current edition of Standard Methods for the Examination of Water and Wastewater or with FDA approved, EPA promulgated methods for the examination of water and wastewater.
CIP Milking System Requirements

1. **Milkline Support**: Support the C.I.P. milking pipeline at least every 10 feet so the entire pipeline and fittings remain in constant alignment and position. Support the pipeline on posts extending from the floor to the ceiling, on barn posts, or on the stanchion supports. Use pipeline supports of stainless steel or other hanger material designed to reduce the possibility of electrolytic action within the pipeline. Milking pipelines may be suspended from ceilings in facilities constructed such that the pipeline maintains its slope year round, i.e. barns with no second story crop storage.

2. **Milkline Slope**: Slope the C.I.P. milking pipeline to be self-draining and have a continuous slope of at least one-inch per ten feet from a high point. The highest point of the milk pipeline shall not exceed seven feet above the cow platform. Provide pitch of at least 1/2 inch per ten feet on the vacuum lines in the direction of airflow.

3. **Stall Cocks**: Install stall cocks (milk inlet nipples) on the upper half of the line.

4. **Milk Pump**: Mount the milk pump for ease of maintenance and inspection. The Department recommends frequent inspection of the milk pump.

5. **CIP Racks**: Ensure all clean-in-place racks and appurtenances are removable from the two-compartment wash sink to provide two unobstructed compartments for washing and rinsing of all other equipment or provide a third wash sink.

6. **Receiver Jar Pits**: Receiver jars installed in pits shall meet all general milkhouse construction requirements as well as the following additional requirements:
   - Size the pit for access for inspection of receiver jar components.
   - Provide adequate lighting above the pit.
   - Slope the pit floor to drain and effectively remove all liquid wastes to protect the receiver group. Removal of liquid waste via a sump is acceptable.

7. **Plumbing Code**: To prevent back-siphoning the Wisconsin Plumbing Code requires that the water inlet of an automatic washer or water hose inlet terminate at least twice its inside diameter above the flood rim of the wash sink.

8. **Water Heating Capacity**: Water heating capacity shall be adequate for all milkhouse operations. Guidance for sizing water heating systems can be obtained from The Dairy Practices Council publication number 58; "Guidelines for Sizing Dairy Farm Water Heater Systems". Alternative hot water heating systems (such as tankless water heaters) may be authorized if the proposed system can provide an adequate supply of hot water for cleaning. A detailed report must be submitted to the Department for review. Hot water requirements for the milk pipeline system, bulk tank washing, and all other hot water needs in the milkhouse and farm operation must be detailed in the submission along with documentation that the alternative hot water heating system capability meets or exceeds these milkhouse and farm operation demands.

9. **Product Adulteration**: Design the system to prevent adulteration of the milk with water, cleaning solutions or sanitizer during milking, storage and CIP operations.

10. **Automatic drains**: Install automatic drains where needed to make all vacuum lines drain completely, i.e., at the bottom of all risers.

11. **Access for Inspection**: Provide a removable elbow on all welded lines to provide access for inspection. Install this elbow in the wash solution return line nearest the milk house.

12. **Vacuum Sizing**: See the instructions on the back of this sheet for sizing the vacuum system, pulsator airline, main airline, and milkline. Note: The instructions are based on ASAE Standard S518. They are only recommendations and do not guarantee proper system sizing.

3-A Accepted Practices, ASAE Standards, and DATCP recommend that the completed system be tested as described in ASAE Standard EP445 to verify proper performance.

1Order from: The Dairy Practices Council
19 Titus Court
Richboro, PA 18954
Telephone/Fax: (215) 355-5133
Or online at www.dairypc.org.
MILKING SYSTEM SIZING

1. VACUUM SYSTEM SIZING
ASAE Standard S518, Annex A
- Allow 35 CFM for basic effective reserve
- Add 3 CFM for each milker unit
- Add 0.5 CFM for each milk meter (or manufacturer specification if different than 0.5 CFM)
- Add CFM for other vacuum equipment according to manufacturer specification
- Add CFM for cleaning if needed based on S518, Annex A3

2. PULSATOR AIRLINE SIZING
ASAE Standard S518, Section 9

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<td>15 or more</td>
</tr>
</tbody>
</table>

¹ metric = nominal ID. inch = US pipe size

3. MAIN AIRLINE SIZING
ASAE Standard S518, Annex B

<table>
<thead>
<tr>
<th>Vacuum pump capacity L/min free air</th>
<th>Approx. length of main airline (m of straight pipe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vacuum pump capacity ft³/min free air</th>
<th>Approx. length of main airline (feet of straight pipe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2 in.</td>
</tr>
<tr>
<td>20</td>
<td>3 in.</td>
</tr>
<tr>
<td>40</td>
<td>4 in.</td>
</tr>
<tr>
<td>60</td>
<td>6 in.</td>
</tr>
<tr>
<td>80</td>
<td>8 in.</td>
</tr>
<tr>
<td>100</td>
<td>10 in.</td>
</tr>
</tbody>
</table>

4. MILKLINE SIZING
ASAE Standard S518, Annex C

Design guidelines and recommendations for maximum number of units per milkline slope to assume stratified flow

- These guidelines are based on the fastest-milking 5% of cows in the US and France, i.e. mean peak milking rate of 5.5 L/min (12 lb/min) per cow.
- Steady air admission within the range 10 to 20 L/min (0.35 to 0.7 ft³/min) per unit through claw air vents and air leaks is assumed in the calculations.
- The guidelines assume that the cross-sectional area of the milkline(s) is not substantially reduced by fittings.
- A slope of 0.8% is equivalent to 8 mm drop per m of run (1 in. drop in 10 ft).
- A slope of 1.2% is equivalent to 12 mm drop per m of run (1.5 in. drop in 10 ft).

Table C1 - Milking parlors: looped milkline with units attached simultaneously by careful operators. Transient air admission of 100 L/min (3.5 ft³/min) per milkline slope.

<table>
<thead>
<tr>
<th>Nominal milkline size</th>
<th>Maximum number of units per slope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.8%</td>
</tr>
<tr>
<td>48 mm (2 in.)</td>
<td>2</td>
</tr>
<tr>
<td>60 mm (2.5 in.)</td>
<td>6</td>
</tr>
<tr>
<td>73 mm (3 in.)</td>
<td>11</td>
</tr>
<tr>
<td>98 mm (4 in.)</td>
<td>27</td>
</tr>
</tbody>
</table>

Table C2 - Milking parlors: looped milkline with units attached simultaneously by typical operators Transient air admission of 200 L/min (7 ft³/min) per milkline slope.

<table>
<thead>
<tr>
<th>Nominal milkline size</th>
<th>Maximum number of units per slope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.8%</td>
</tr>
<tr>
<td>48 mm (2 in.)</td>
<td>1</td>
</tr>
<tr>
<td>60 mm (2.5 in.)</td>
<td>4</td>
</tr>
<tr>
<td>73 mm (3 in.)</td>
<td>9</td>
</tr>
<tr>
<td>98 mm (4 in.)</td>
<td>24</td>
</tr>
</tbody>
</table>

Table C3 - Stanchion barns: looped milklines with units attached every 30 seconds per slope Transient air admission of 100 L/min (3.5 ft³/min) per milkline slope.

<table>
<thead>
<tr>
<th>Nominal milkline size</th>
<th>Maximum number of units per slope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.8%</td>
</tr>
<tr>
<td>48 mm (2 in.)</td>
<td>2</td>
</tr>
<tr>
<td>60 mm (2.5 in.)</td>
<td>6</td>
</tr>
<tr>
<td>73 mm (3 in.)</td>
<td>(9)</td>
</tr>
</tbody>
</table>

NOTE - Asterisk indicates an unlimited number at units when they are attached at 30 s intervals. If more than one operator is attaching units on the same slope, the attachment rate may be quicker than one unit every 30 s. If so, then the guideline figures in table C1 could be used.

NOTE - The main airline is defined as the pipeline between the vacuum pump and the sanitary trap near the receiver. These calculations are based on a maximum vacuum drop of 2 kPa (0.6 in. Hg) between the vacuum pump and receiver. The maximum air flowrate is normally from the vacuum regulator to the pump. Whenever additional air enters the milking clusters during milking, however, the maximum air flowrate is from the receiver to the vacuum pump.

These tables include an allowance for the equivalent length (m or feet of straight pipe) of one distribution tank, one sanitary trap and eight elbows. If the system includes more than eight elbows, then use the next pipe length column to the right for every three additional elbows. In systems with two receivers, the theoretical maximum air flowrate in the two separate airlines between the distribution tank and the sanitary traps may be halved. The size of these split lines can be reduced according to the values in the table corresponding to half the vacuum pump capacity.

This institution is an equal opportunity provider.
Recessless or Rolled-On Ferrules on Milking Pipelines

On January 1, 2001, recessless or rolled-on ferrules were no longer accepted for milking pipeline installations. ATCP 65.14(1), Wisconsin Administrative Code requires that milking and milk handling system shall comply with “3-A Accepted Practices for the Design, Fabrication and Installation of Milking and Milk Handling Equipment, 606-05.

3-A Accepted Practice, Number 606-05 states that recessless or rolled-on fittings are acceptable only when temporarily modifying or repairing existing on-site farm milk handling systems with fittings installed with no cracks or crevices.

Please use the following criteria for the evaluation of pipelines utilizing recessless or rolled-on ferrules.

For existing farm milking and milk handling systems on currently licensed farms; when rolled on ferrules are in use, make a note that they were observed and that they are permitted when in good repair until the farm is sold or changes licenses.

Licensing a Milk Producer at an existing licensed farm.

When licensing a producer that is taking over an already licensed and operating farm, where the farm has meet all requirements of ATCP 65 other than the rolled on ferrules, a Grade A permit can be issued and an administrative conditional license not to exceed 180 days for repair.

Licensing a Milk Producer at an existing farm that is not in operation.

- When licensing a milking facility with an existing pipeline with rolled on ferrules, the sanitarian is to discuss the issue with the producer and dairy plant field rep and come to an agreement with the producer on timeline to get these rolled on ferrules removed. The sanitarian shall write an administrative conditional license agreement for a Grade B License only with no more than 180 days for repair. Do not issue a Grade A Permit when Rolled on Ferrules are present.

Repairs to systems installed on or after January 1, 2001 utilizing welded ferrules.

- Recessless or rolled on ferrules may be used for emergency repairs where welding equipment is not available. Replace these fittings with a welded fitting as soon as practical. Recessless or rolled-on ferrule is only a temporary repair not to exceed 7 days.
Milking Parlor Construction Standards
This standard applies to milking parlors where CIP milking equipment is cleaned and stored.

1. **Floor and Gutter Construction:**
   a. Shall be constructed of concrete or other materials that are equally impervious and easy to clean.
   b. Parlor mats shall be removable to allow for cleaning.
   c. Shall be sloped at least one inch per 10 feet to the drain. Gutter covers, if installed, shall be made of impervious material and be removable for cleaning.
   d. A watertight sump with pump may be used to remove liquid waste from the parlor.

2. **Wall and Ceiling Construction:**
   a. Shall be constructed of smooth impervious materials. Finishes shall be light colored and easy to clean.
   b. Doorways to and from the milking parlor shall be provided with tight-fitting solid doors. These doors shall be closed when equipment is being cleaned or stored. Curtains are not allowed as a replacement for solid doors. Complying non solid doors require a variance from the Dept. Openings shall be protected against entry of insects, rodents and other pests.
   c. Windows should be installed flush with the inside parlor walls or the sill should be sloped to drain.
   d. Open-air parlor facilities are designed for non-confined animal housing systems (rotational grazing). These facilities are exempt from CIP parlor wall, door and window standards. All open-air parlors require a formal variance issued by the department. Contact the area Dairy Technical Specialist for additional information.

3. **Lighting:**
   a. Natural or artificial lighting shall be provided to ensure adequate illumination for milking operations.
   b. There shall be at least 10 foot candles of illumination in all working areas and 30 foot candles of illumination in all areas of the parlor where CIP milking equipment is cleaned, sanitized, and stored.

4. **Ventilation:**
   a. Shall be adequate to prevent visible condensation on walls, ceiling, and to prevent excessive odors. Heating, ventilating, and air conditioning systems shall be designed so that air from the parlor, animal housing areas, and toilet room may not enter the milk storage room.
5. **Milking handling equipment:**
   a. All equipment shall comply with 3A Accepted Practice 606-05 and ASAE Standard S518.2.
   b. Before installing a milk handling system, the installer shall submit plans to the department for review.
   c. New milk handling systems or equipment shall not be sold until specifications or prototype equipment are first reviewed by the department.
   d. Butterfly valves shall be of sanitary design and construction. They shall be easy to access and disassemble. Butterfly valves shall be disassembled and cleaned after each milking.
   e. Air under pressure in contact with milk shall comply with 3A Accepted Practice 604-05. Areas of primary concern are the use of a disposable media filter and the sanitary check valve located at the point of application.
   f. Milk handling systems shall be effectively separated from the cleaning make-up vats or the CIP solution lines during milking to avoid possible contamination.
   g. CIP milking equipment, if cleaned, sanitized or stored in the milking parlor, shall be designed, installed, handled and stored so that milk contact surfaces are protected from contamination at all times.
   h. The installation of the receiver group in a pit is not recommended unless it is accessible, easy to clean, and maintain. Receiver groups should not be under cow decks, stairs, or in an area exposed to excessive manure. Adequate means is provided to preclude cross-contamination of the milking system with the floor drains located within the pit.
   i. Pipelines Mounted inside Tunnel Structures
     - Tunnel structure must be watertight and of vermin resistant material.
     - Structure shall be adequate in size to provide for inspection and servicing when needed.
     - There are to be no clamped fittings inside the tunnel area.
     - Lines must be properly supported to maintain the required slope.
     - Milkhouse end of the tunnel must be tightly closed off to prevent air exchange between the two rooms. The tunnel floor must slope to drain in the direction of the parlor.

6. **Water systems:**
   a. Wells used to supply water shall comply with chapter NR 812, Wisconsin Administrative Code.
   b. All plumbing shall comply with DPSPS plumbing code, Wisconsin Administrative Code.
   c. Water discharged from milk pre-coolers may be used for milkhouse and milking parlor operations, watering livestock, and holding area wash down.
     - Pre-cooler water reclaim system shall meet the requirements listed in department guideline F-fd-36, *Wisconsin Dairy Farm Milk Pre-Cooler Requirements*.
     - Reclaimed water storage tanks shall not be cross connected to the potable water system.
Outlet lines from the plate cooler shall not be cross connected to the potable water system.

d. An air gap shall be maintained between every potable water outlet and the flood rim of the vessel that it supplies, and between the potable water outlet and any source of potential contamination, unless an acceptable method of protection is provided.

e. If cows are cleaned in a milking parlor prep stall prior to milking, rather than being manually cleaned at the milking stations, hot water under pressure shall be supplied to the prep stall and used for cleaning purposes. There shall be an adequate supply of hot water so that all cows handled through the prep stall may be fully cleaned without impairing the availability of hot water for other parlor or milkhouse operations.

7. **Wastewater Handling:**

a. Wastewater containing milky pre-rinse from pipelines and bulk tanks can be used for animal feed or deposited in the manure handling system.

b. Detergent wash, acid rinse, and sanitizing solutions (graywater) may be collected and reused for milking parlor floor, wall and holding area wash-down.

c. Wastewater generated during water softener discharge may be used for milkhouse, milking parlor, and holding area wash-down.

d. Wastewater collected from floor drains shall not be reused for milking parlor floor, wall, and holding area wash-down.

e. Manure and liquid wastes from milking parlor operations shall be drained and removed from the parlor in a sanitary manner after each milking, so that there are no solid or liquid waste accumulations in the milking parlor.

f. Sewage from toilets and showers shall be disposed of in a septic system. Sewage shall not be disposed of in the manure handling system. The use of chemical toilets, pit privies, and incinerator toilets meet the intent of this section.
Mini-Milkhouse/Pumphouse Requirements

The following is a clarification of the practice of installing a mini-milkhouse or pumphouse.

**Definition:**
Mini-milkhouse/Pumphouse: An area outside of the milkhouse or clean-in-place parlor used to house acceptable milking equipment as listed below.

**Purpose:**
To allow the installation of a pipeline system in milking facilities when, due to the existing construction and facility layout, it is impossible to provide the proper placement of milking equipment in the milkhouse or clean-in-place parlor.

**Acceptable Equipment:**
1. Receiver Jar
2. Milk Pump
3. Milk Line Drain
4. Moisture Trap
5. Plate Type Pre-Cooler

**Construction**
1. Walls, floor and ceiling must comply with milkhouse standards.
2. Provide a trapped floor drain or a properly installed and maintained sump.
3. Provide adequate room to service equipment.
4. Maintain the enclosure in a clean condition and accessible for inspection.
5. Provide adequate lighting - 30ft candles of illumination.
6. Provide hot and cold running water directly plumbed to the enclosure or accessible to the enclosure through a hose station or bucket and brush.
7. Ensure all access points into the mini-milkhouse are dust tight.
8. Access may be accomplished from the milking barn.
Air Injector Requirements

The location of any air injector(s) must be listed on the pipeline plan submitted for review. All air injectors used for milk handling systems shall be in compliance with the following requirements.

1) Air injectors shall be installed in the milkhouse, milking parlor or room of equivalent cleanliness.
   - Installation of air injectors in a milking barn is not allowed.
   - Pressurized air used for air injection shall be of sanitary quality.
   - Air injectors installed in a milking parlor shall be equipped with an appropriate filter and properly protected from contamination.

2) Air injectors installed on a milkline shall meet sanitary construction standards for product contact surfaces.
   - Air injectors located on a wash manifold or wash line do not need to meet sanitary construction standards.

3) Air injectors shall be close-coupled to the milkline.
   - Distance between the air injector valve seat and the side-wall of the milkline shall not exceed two times the diameter of the injector mounting port. No dead end shall exceed 5 inches.

4) Air injectors previously installed that do not meet the close-couple requirements may require a separate wash supply line, jumper hose, or manual cleaning to assist in maintaining a clean stand pipe. These may also be modified to meet the close-couple requirements.
   - All supply lines or jumper hoses shall be physically separated from the milkline during milking.
   - Any openings in the milkline shall be properly protected using clean sanitary caps.
   - Jumper hoses or sanitary caps shall be cleaned and stored in the milkhouse when not in use.

If you have any questions please contact your area Dairy Technical Specialist
Direct Chemical Addition into Water Systems (Peroxide and Other Chemicals)

Wisconsin has two 'Water Authority' agencies. DNR is responsible for enforcement of Regulations covering the water system from the well to the pressure tank. Department of Safety and Professional Services (DSPS) is responsible for enforcement of Regulations covering the drinking water system from the pressure tank to its end use. (If there is suitable backflow protection between the well and the pressure tank, the boundary of DSPS responsibility moves upstream to that point.) Approval documents related to direct chemical injection are required from whichever agency has “jurisdiction” depending on when injection occurs.

DNR Requirements:

1) DNR Approval letter
2) Licensed Pump Installer who conduct the installation of the Chemical Injection System.
3) DSPS approved metering pump
   https://verification.dsps.wi.gov/Industry-Service-Searches/ProductResults?DescrID=WTCID
4) NSF 60 approved chemical with certification letter from mfr. or label with required information
5) The injected chemical(s) must be Generally Recognized As Safe (GRAS) and be listed in the certification letter or label
6) Chemical(s) must be injected at approved concentration

DSPS Requirements:

1) Licensed Plumber who conduct the installation of the Chemical Injection System.
2) DSPS approved metering pump
   https://verification.dsps.wi.gov/Industry-Service-Searches/ProductResults?DescrID=WTCID
3) NSF 60 approved chemical with certification letter from mfr. or label with required information
4) The injected chemical(s) must be GRAS and be listed in the certification letter or label
5) Chemical(s) must be injected at approved concentration

All required information must be readily available on the farm. Information must also indicate pump setting and concentration (ppm) of chemical actually injected.
### Backflow Prevention Guide
For Agricultural Applications

<table>
<thead>
<tr>
<th>Hazard/Equipment</th>
<th>Approved devices or methods(^2)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Air gap ANSI std.</td>
<td>ASSE 1013</td>
</tr>
<tr>
<td>Pasteurized product lines w/out cleaning solution</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Raw product lines w/cleaning solution</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Animal watering tanks</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cooling water w/out additives</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reclaimed water (low hazard)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reclaimed water (high hazard)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chemical injector or proportioner</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Boiler w/ non-toxic additives</td>
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<td>X</td>
</tr>
<tr>
<td>Boiler w/ toxic additives or pot feeder</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Separator bowl installed downstream of pasteurization</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Separator bowl installed upstream of pasteurization</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Homogenizer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pump seals (open)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Portable pressure washer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Permanent pressure washer</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

\(^1\) No valves downstream of the device.

\(^2\) Also see manufacturers limitations for devices.
VARIOUS MANUFACTURERS OF BACKFLOW PREVENTERS.

ASSE 1001  PIPE APPLIED ATMOSPHERIC VACUUM BREAKER

<table>
<thead>
<tr>
<th>MANF.</th>
<th>MODEL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATTS</td>
<td>288A</td>
</tr>
<tr>
<td>WILKENS</td>
<td>35</td>
</tr>
<tr>
<td>FEBCO</td>
<td>710 &amp; 715</td>
</tr>
<tr>
<td>CONBRACO</td>
<td>38-100 &amp; 38-200</td>
</tr>
<tr>
<td>CASH-ACME</td>
<td>V-101</td>
</tr>
</tbody>
</table>

ASSE 1011  HOSE CONNECTION VACUUM BREAKER

<table>
<thead>
<tr>
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<th>MODEL NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATTS</td>
<td>8, 8A, 8AC, 8B, 8BC, 8C, NF8, NF8C, 8P, 8FR</td>
</tr>
<tr>
<td>WILKENS</td>
<td>BFP-8 &amp; BFP-8F</td>
</tr>
<tr>
<td>CONBRACO</td>
<td>38-304, 38P, 38-400, 38-404</td>
</tr>
<tr>
<td>CASH-ACME</td>
<td>V-3, V-4, VB-222</td>
</tr>
<tr>
<td>FABCO</td>
<td>731 series</td>
</tr>
<tr>
<td>DANFOSS</td>
<td>HB8</td>
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</table>

ASSE 1012  BACKFLOW PREVENTER WITH INTERMEDIATE VENT

<table>
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<th>MODEL NO.</th>
</tr>
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<tbody>
<tr>
<td>WATTS</td>
<td>9-D</td>
</tr>
<tr>
<td>WILKENS</td>
<td>750</td>
</tr>
<tr>
<td>FEBCO</td>
<td>815</td>
</tr>
<tr>
<td>CONBRACO</td>
<td>40-400 &amp; 4J-400</td>
</tr>
<tr>
<td>CASH-ACME</td>
<td>BFP</td>
</tr>
<tr>
<td>DANFOSS</td>
<td>8200</td>
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</tbody>
</table>

ASSE 1013  REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER

<table>
<thead>
<tr>
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<th>MODEL NO.</th>
</tr>
</thead>
<tbody>
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<td>WATTS</td>
<td>009, 909, 995, N995, Z995</td>
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<tr>
<td>WILKENS</td>
<td>375, 975, 975XL, 975BMS/MS, 975XLBMS/MS</td>
</tr>
<tr>
<td>FEBCO</td>
<td>860,880, 880V, 825, 825YA, 820</td>
</tr>
<tr>
<td>CONBRACO</td>
<td>40-200, 40-200U, 40-200Z, 4S RP</td>
</tr>
<tr>
<td>FLOMATIC</td>
<td>RPZE, RPZ IIE</td>
</tr>
</tbody>
</table>

ASSE 1019  VACUUM BREAKER WALL HYDRANTS

<table>
<thead>
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<th>MODEL NO.</th>
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<tbody>
<tr>
<td>WATTS</td>
<td>HY-42, HY-42B, FHB-1 &amp; FHB-2</td>
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<tr>
<td>WILKEN</td>
<td>Z1300 series</td>
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</table>
ASSE 1020 PRESSURE VACUUM BREAKER ASSEMBLY

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>WATTS</td>
<td>800</td>
</tr>
<tr>
<td>WILKENS</td>
<td>420, 720A</td>
</tr>
<tr>
<td>FEBCO</td>
<td>765, 765U</td>
</tr>
<tr>
<td>CONBRACO</td>
<td>40-500, 4V-500,</td>
</tr>
<tr>
<td>FLOMATIC</td>
<td>PVB</td>
</tr>
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ASSE 1052 HOSE CONNECTION BACKFLOW PREVENTER

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</thead>
<tbody>
<tr>
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<td>N9-CD</td>
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<tr>
<td>CONBRACO</td>
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<td>NIDEL</td>
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<tr>
<td>WILKINS</td>
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ASSE 1056 BACK SYPHONAGE VACUUM BREAKER

<table>
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<tr>
<td>WATTS</td>
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<tr>
<td>CONBRACO</td>
<td>4W-500</td>
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</tbody>
</table>

ASSE 1055 CHEMICAL DISPENSING SYSTEMS
(An Internal Air Gap Device)

- a) Type A: These devices have the chemical(s) pressurized above atmospheric pressure; and
- b) Type B: These devices do not pressurize the chemical(s) above atmospheric pressure. The only source of back pressure comes from an elevated hose.

<table>
<thead>
<tr>
<th>STD.</th>
<th>HAZARD</th>
<th>LIMITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSE 1001</td>
<td>HIGH</td>
<td>NO VALVES AFTER, NO BACK PRESSURE, 12 HR. MAX.</td>
</tr>
<tr>
<td>ASSE 1011</td>
<td>HIGH</td>
<td>NO VALVES AFTER, 12 HR. MAX.</td>
</tr>
<tr>
<td>ASSE 1012</td>
<td>LOW</td>
<td></td>
</tr>
<tr>
<td>ASSE 1013</td>
<td>HIGH</td>
<td></td>
</tr>
<tr>
<td>ASSE 1020</td>
<td>HIGH</td>
<td>NO BACK PRESSURE</td>
</tr>
<tr>
<td>ASSE 1052</td>
<td>HIGH</td>
<td>NO VALVES AFTER, 12 HR. MAX.</td>
</tr>
<tr>
<td>ASSE 1056</td>
<td>HIGH</td>
<td>NO BACK PRESSURE</td>
</tr>
<tr>
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</table>

Air Gap Calculation contact your local DSPS Plumbing Consultant at

or via email at DspSbPlbgTech@wi.gov