



**Agriculture
and Markets**

Division of Milk Control

Milking Equipment Installer Guideline

2015 Revision

Instructions for Making an Application to Install / Modify Milk Handling Equipment on a Dairy Farm, Direct Loading System or Automatic Milking Installation (AMI)

Requirement for Submitting Applications Prior to Starting an Installation

From 1 NYCRR Part 2 Regulations:

§2.64 EQUIPMENT INSTALLER PERMIT.

(a) Any person who commercially constructs, reconstructs, or extensively renovates a milkhouse, milking barn, stable or parlor in a dairy farm or who constructs or extensively renovates a transfer station, receiving station or milk plant, and any person who commercially installs or modifies milk handling equipment on dairy farms or in milk plants, transfer stations or receiving stations shall file an application for a permit upon a blank prepared under the direction of the commissioner and shall set forth the information deemed necessary by the commissioner for the administration of this Part. The commissioner may decline to grant a permit, or may suspend or revoke a permit, upon due notice and opportunity for a hearing, when he is satisfied by substantial evidence that the applicant or permit holder does not have the qualifications to properly install equipment or has not complied with the provisions of subdivision (b) of this section. A permit holder shall inform the commissioner when any information set forth in his application is no longer accurate.

(b) Every equipment installer shall submit plans for the construction, reconstruction or extensive renovation of a milkhouse, milking barn, stable or parlor in a dairy farm or for the construction, reconstruction or extensive renovation of a transfer station, receiving station, or milk plant, or for the installation or modification of milk handling equipment on dairy farms or in milk plants, transfer stations or receiving stations in a form approved by the Commissioner and shall set forth and describe the equipment to be installed and the manner of installation. No work shall be done unless the plans therefore are submitted to the commissioner and the commissioner determines that the work to be done will not cause the dairy farm, milk plant, transfer station or receiving station, as the case may be, to be in noncompliance with the provisions of this Part. If the commissioner approves plans, all work shall substantially conform to the approved plans.

(c) Failure to comply with the requirements of this section shall subject such persons to the penalties authorized in Section 40 of the Agriculture and Markets Law and/or registration, suspension or revocation.

Completely & legibly fill in the appropriate application forms; Application to Install / Modify Milk Handling Equipment on a Dairy Farm DMC-1517, and the supplemental forms for Automatic Milk Installations DMC-1537 and Direct Loading Installations DMC-1543, when applicable.

Submit hard copies of the completed application(s) and required information as follows: two copies to the Dairy Products Specialist 2 (Regional Supervisor) for the County the producer farm is located in and one copy to the Certified Milk Inspector (CMI) representing the milk cooperative / handler. See map in Appendix A for counties and regions. Mailing addresses for Division of Milk Control staff can be obtained by contacting our office at (518) 457-1772.

The applications are electronically fillable and may be submitted via email. If this route of submission is chosen then it will be necessary to submit all of the required information in this manner. Files must be in Portable Document Format (PDF). Plan drawings must be legible when viewed by computer. Otherwise, it shall be necessary for our Department to request hard copies if plan drawings are not legible. Email addresses may be obtained by contacting our office as stated above.

Applications and plans are reviewed by the CMI representing the milk cooperative in consultation with a Dairy Products Specialist (DPS) representing the Division of Milk Control. Applications and plans must be approved by the DPS prior to starting any installation. While it is recommended that the producer, fabricator, CMI and representatives of this Department be brought together in the earliest stages of planning, all applications must be submitted no less than 30 days prior to the anticipated date of installation. Please allow 10 business days for the review of plans and response from this Department. A variance from this timeframe requirement can be given in the case of a documented emergency. A variance will only apply to modifications and all related information would need to be received in a timely manner.

All applications must be accompanied by a detailed legible line drawing of the milking system indicating the following items when present:

1. Bulk milk Tank	5. Floor drain	9. Receiver Group	13. Milk filters	17. Wash Manifold	21. Air Blow Assembly
2. Double wash vat	6. High Point	10. Weigh Jars	14. Vacuum pump	18. Reclaimed water tank	22. Pre-rinse divert valve
3. CIP Pipeline vat	7. Vacuum test port	11. Pipeline inspection port	15. Wash flow (blue line)	19. Backflow prevention device	
4. Hand wash sink	8. Air Injector	12. Milk Pre-cooler	16. Milk flow (red line)	20. Chart Recorder	

All applications must be accompanied by complete information with regard to hot water requirements for equipment washing and cooling information for milk cooling. Please see subsequent sections for more detailed information.

References for Installers

State of New York Dept. of Agriculture & Markets Division of Milk Control	10B Airline Drive Albany, NY 12235 518-457-1772 1-800-554-4501 www.agriculture.ny.gov
ASABE Standards • ANSI/ASABE AD5707:2007 • ANSI/ASABE AD6690:2007 • ANSI/ASABE AD20966:2007	American Society of Agricultural Biological Engineers 2950 Niles Rd St Joseph MI 49805 269-429-0300 or 800-606-2304 Email: hq@asabe.org Web site: www.asabe.org
3-A Sanitary Standards and Accepted Practices	3-A Sanitary Standards, Inc. 6888 Elm Street Suite 2D McLean, Virginia 22101 703-790-0295 3-Ainfo@3-A.Org
Guidelines on milking parlors, milk pre-coolers, water heater sizing, etc.	The Dairy Practices Council 19 Titus Court Richboro, PA 18954 Tel/Fax 215-355-5133 Email: dairypc@dairypc.org Web site: www.dairypc.org
Welding Guidelines, AWS D:18.1 and D:18.2	American Welding Society 8669 NW 36 Street, # 130 Miami, Florida 33166-6672 Phone: 800-443-9353 or 305-443- 9353 www.aws.org

Design, Fabrication and Installation of Milking and Milk Handling Equipment

All milking and milk handling equipment shall be designed and fabricated to meet or exceed the requirements as stated in the 3-A Sanitary Standards, Inc.'s "3-A Accepted Practices for the Design, Fabrication and Installation of Milking and Milk Handling Equipment, Number 606-05" and the American Society of Agricultural Engineers' "ANSI/ASABE AD5707:2007 (JAN2011) Milking Machine Installations - Construction and Performance".

Installation of equipment and construction of milking facilities shall be completed with due consideration to all sanitation requirements of the 1 NYCRR Part 2 Regulations and the Pasteurized Milk Ordinance (PMO).

An analysis of the milking system must be completed as outlined in the ASABE Standard "ANSI/ASABE AD6690:2007 (JAN 2011) Milking machine installations - Mechanical tests" or as described in the National Mastitis Council (NMC) publication "Procedures for Evaluating Vacuum Levels and Air Flow in Milking Systems" prior to using the system for milking. A copy of the report must be left at the producer facility and be made available for review by the Certified Milk Inspector representing the cooperative handling the producer milk as well as other regulatory agencies.

In addition to the standards referenced above the following items shall be considered or required where stated. See applicable information in the following for additional requirements regarding Automatic Milking Installations and Direct Loading operations.

Welded Pipelines

Good manufacturing practices recommend that a sample weld be made at the start of each days welding, dated with the welder's identification and made available at the producer location for evaluation. Welds on pipelines and other equipment must be inspected by a CMI representing the cooperative handling the producer milk during the installation. Welds should be made and reviewed according to AWS D18.1 *Specification for Welding Austenitic Stainless Steel Tubing Systems in Sanitary (Hygienic) Applications* and AWS D18.2 *Guide to Weld Discoloration Levels on Inside of Austenitic Stainless Steel Tube*.

Standard lengths of pipe should be used as much as possible to minimize the number of gaskets and welds.

The pipeline should be of uniform diameter. If a change in diameter is required then proper fittings must be installed to allow for proper drainage.

Rolled-on fittings may be used when modifying or repairing existing on-site farm milk handling systems.

If new milk line or wash line is installed / expanded by the addition of new piping then those fittings must be welded.

When a previously used pipeline is moved to a different facility then any repairs or modifications to that pipeline must be welded.

Receiver Group

The receiver cannot be welded into the system.

Milk probes must be removable without disassembly of the receiver group. The receiver group must be installed in an area that is cleanable and provides protection from dust or animal droppings.

Installation of the receiver group in the milkhouse is preferable. Installation in a milking parlor is acceptable if the equipment is located to provide protection from contamination, is accessible and a means of inspection can be demonstrated. The equipment cannot be installed under a cow platform or in a recessed area which would require equipment disconnection and removal for routine maintenance and inspection.

Installation of a receiver group in a pit is permitted if a trapped floor drain is provided in the pit and a means for inspection can be demonstrated.

A separate room for the receiver group is permitted. This room must be constructed with washable walls and ceilings, a concrete floor with drain, adequate lighting, proper ventilation and at least cold water under pressure. This room must be large enough to provide room for the required equipment and for maintenance and inspection.

Vacuum System and Milk Line Sizing

Vacuum systems and milk lines must be designed and sized according to "ANSI/ASABE AD5707:2007 (JAN2011) Milking Machine Installations - Construction and Performance". See Appendix for Milking System Sizing tables.

Vacuum requirements other than those asked for on the DMC 1517 application must be attached separately to the application.

Pipeline Clean in Place (CIP) Systems

In the State of New York all on-farm pipeline CIP systems are required to be fully automatic. A fully automatic wash system is defined as a wash system which proceeds through a series of pre-rinse, wash and post rinse cycles of predetermined length without manual intervention after initial activation.

A pre-rinse divert valve shall be provided to divert the first rinse to drain. Pre-rinse divert valves cannot be piped directly into a sewer drain. A sufficient air gap must be provided.

Water fill pipes cannot be piped below the flood rim of wash vats.

Wash vat drains may be piped directly to sewer systems.

Where manual cleaning of equipment is required, a 2 compartment wash vat must be provided in the milkhouse to wash and rinse equipment.

The current in use cleaning program, including water hardness and detergent and sanitizer concentration must be posted in the milkhouse. The cleaning instructions must be accurate for the chemicals currently available in the milkhouse.

It is important that cleaning programs are designed to include a sanitizing step. Often times we find systems that do not include a sanitizing step. Systems that do not include sanitizer are considered to be in violation of the requirements of the PMO.

Air injectors shall be installed in the milkhouse or an approved clean-in-place parlor.

Air injectors installed in the milking parlor shall be equipped with an acceptable filter.

The installation of air injectors in a milking barn or animal housing area is not allowed.

Hot water

Each milkhouse and milking facility shall be provided with facilities for heating water in sufficient quantity and to such temperatures for the effective cleaning of all equipment and utensils.

Hot water heating systems used for Clean in Place (CIP) wash systems must be able to fill the wash vat or sink with no less than 160°F water in 10 minutes.

The installer or producer 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."

A worksheet showing how the minimum volume of hot water necessary for each cycle (pre-rinse, wash, post rinse, sanitize) was determined must be attached to the submitted application.

Heat recovery systems that are equipped with a heating element may be used when determining hot water requirements.

Heat recovery systems that are not equipped with a heating element cannot be used to determine hot water needs. They may be incorporated into the system but the system cannot be downsized based on an assumed constant temperature of preheated water.

Supplemental heating systems (e.g. outdoor wood furnaces, solar systems) may be used for pre-heating water that is feeding a dedicated, automatic water heating system.

For on demand water heating systems, the outlet flow data and the manufacturer's installation requirements must be submitted with the application along with a worksheet showing how the size and flow of the unit will provide the needed amount of hot water.

Compressed Air

Compressed air systems used for product contact, such as air blow assemblies, must be installed per the PMO Appendix H, II. Air for Drying Equipment and Air Under Pressure - Direct Contact with Milk and Milk Products and Milk Product-Contact Surfaces. Further detail can be found in 3-A Sanitary Standards, Inc. "3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-".

All air blow assemblies must be equipped to utilize disposable point of use filter media and installed to allow disassembly for maintenance and inspection.

Compressed air systems must be protected to preclude contamination of the air piping system.

There shall be no lines installed that by-pass the filter assemblies on product contact compressed air lines unless provisions are made to provide proper filtering on the by-pass line.

Clean and dry storage located convenient to point of use must be considered for air blow filter storage.

Farm Milk Cooling and Storage Systems

All farm milk cooling and storage systems shall be designed, fabricated and installed to meet or exceed the 3-A Sanitary Standards, Inc.'s *3-A Accepted Practices for Farm Milk Cooling and Storage Systems Number 611-*.

Installation of equipment and construction of milk storage facilities shall be completed with due consideration to all sanitation requirements of the 1 NYCRR Part 2 Regulations and the Pasteurized Milk Ordinance (PMO).

In addition to the standards referenced above the following items shall be considered or required where stated.

Pre-Cooler Installation

The installation of pre-coolers, all types, shall comply with 3-A 606-05.

Pre-coolers shall drain completely and automatic drains shall be provided where needed. Multiple pass coolers shall be designed to allow drainage of all the passes that can trap water.

Install pre-coolers to accommodate access for inspection and cleaning. Provide any tools needed for disassembly near the cooler.

There shall be no by-pass lines installed on the milk inlet to the milk outlet lines of the pre-cooler in an effort to increase cleaning solution flow rate. Pumps and heat exchangers must be sized correctly to allow proper flow of cleaning solutions through the heat exchanger to provide for proper cleaning.

A sanitary sampling valve located in an accessible location and properly close coupled to the main line shall be located on recirculated cooling systems.

Bulk Milk Cooling Tanks, Storage Tanks and Storage Silos

Construction

Bulk milk cooling tanks, storage tanks and storage silos shall meet the sanitary construction requirements of 3-A[®] Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-11 and 3-A[®] Sanitary Standards for Farm Milk Storage Tanks, Number 30-01 as applicable.

Used tanks must be inspected for condition and proper sanitary design prior to approval of application.

Installation

Farm bulk tanks shall be installed in a milkhouse meeting all applicable requirements of 1NYCRR Part 2 and the most current revision of the PMO.

Safe and suitable access to the tank opening shall be provided when climbing ladders or steps are necessary for normal operation.

The foundation for a farm milk tank shall be constructed with due consideration of frost penetration and shall be of sufficient strength to support the fully liquid-laden tank without change of level (1NYCRR Part 220.7).

The distance between the top of the milk tank and the ceiling shall not be less than 36 inches. The minimum acceptable dimensions for a recessed ceiling are five feet by five feet, and the recessed area of the ceiling shall be positioned off center in such a manner that the maximum area is available for placing the test equipment. This subdivision shall apply only to farm milk tanks installed on or after March 1, 1979 (1NYCRR Part 220.7).

The above clearance requirement is a requirement of the NYS Division of Weights and Measures to allow for proper utilization of calibration equipment. It is recommended that any ceiling recessed to meet the requirement be cleared in advance with the local County Office of Weights and Measures representative who will be responsible to calibrate the tank when the installation is completed.

Bulk milk storage tanks shall be positioned so that there is not less than 30 inches of working clearance on all sides with the following exception:

There shall be not less than 36 inches of unobstructed clearance on the outlet valve side, the wash vat side and the cleaning side.

Clearances shall be measured horizontally from the widest part of the body of the tank and not from any projecting part or accessory fitting, except measurement shall be from projecting parts of the tank or accessory fittings that extend the entire length or width of the tank.

Bulk tanks shall be located so that the outlet valve is not less than 18 inches from any floor drain.

Bulk tanks shall not be located over the top of any floor drain.

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 meeting the requirements found within 3-A[®] Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-11, shall be located inside the milkhouse.

Lights suitable for illuminating the interior of the tank and the exterior portion of the tank in the vicinity of the measuring rod and manhole shall be permanently installed in the milkhouse.

Single manhole tank installations require a permanently installed light which can be extended through the manhole to illuminate the interior of the tank for inspection and special maintenance.

All single manhole tanks are required to have an automatic wash system, manual washing is not acceptable.

Sampling Milk from Bulk Tanks

Bulk tanks and/or vertical storage silos equipped with aseptic septum type samplers (e.g. QMI) or any non-traditional (e.g. pet cock style sampling valve) shall have a Standard Operating Procedure (SOP) for sampling developed by the milk cooperative's CMI and then approved by this Department.

The CMI shall make arrangements to assure that anyone responsible for using such sampling devices has been trained on proper use and that equipment and supplies are properly maintained.

All SOPs shall be posted in the milk house.

Temperature Recording

All farm bulk milk tanks manufactured after January 1, 2000 shall be equipped with an approved temperature recording device in accordance with Item 18r of the most current revision of the PMO.

Chart recorders, when required or utilized, shall be located to provide protection to the equipment and to allow ease of access for both the producer and regulatory agency. Temperature recording chart location shall be approved by the CMI and producer prior to installation.

Milkhouse - General Recommendations

In addition to the requirements of the 1 NYCRR Part 2 regulations and the PMO, the following is offered as extra guidance for milk house operations. The following items are best addressed well in advance to completion of plans. A collaboration between producer, installer, CMI, Milk Haulers, NYS and subcontractors will provide for a more functional and longer lasting facility.

Proper ventilation in milk houses is often overlooked and must be considered on all installations. Proper insulation and ventilation will reduce odors, condensation and growth of molds and algae in the milk house. A minimum ventilation rate of 4 air changes per hour is recommended by Dairy Practices Guideline #41.

In an effort to increase the life span of floors and walls in the milk house consideration must be given to directing all drain water into drains rather than run the water across a floor. This is especially true of CIP drain water from tanks, wash vats and other equipment. When running pipes to floor drains be sure to maintain a minimum air gap of 1 inch above the drain.

Consideration must be made for the storage of pails, brushes and other appurtenances used for manually cleaned items. Open shelving and hooks have been used successfully for these items.

Clean, covered and dry storage space must be provided for milk filters, air blow filters, paper towels used for teat prep and other related single service articles.

A sampling workspace for the milk hauler should be provided in the milk house. This could be a small, wall mounted fold down shelf or table that will allow the hauler to place sampling items, notebook, etc. The shelf or table should be fabricated of easily cleanable material that will withstand humidity changes often found within the milk house.

Automatic Milking Installations (AMI)

As defined in the PMO: "AUTOMATIC MILKING INSTALLATION (AMI): The term Automatic Milking Installation (AMI) covers the entire installation of one (1) or more automatic milking units, including the hardware and software utilized in the operation of individual automatic milking units, the animal selection system, the automatic milking machine, the milk cooling system, the system for cleaning and sanitizing the automatic milking unit, the teat cleaning system, and the alarm

systems associated with the process of milking, cooling, cleaning and sanitation.”

AMI systems shall be installed in accordance with all applicable requirements of Section 7 and Appendix Q of the PMO. FDA issued a Memorandum of Information M-I-14-8 dated April 21, 2014. This document was issued as information and guidance for interpretation of the requirements of Appendix Q.

The milk house and other portions of the installation shall meet all of the applicable requirements of Section 7 of the PMO as well as those in this document.

Applications for Installation

The DMC 1517 as well as the DMC 1537 Supplemental Application for Automatic Milking Installation (AMI) must be completed in full.

All applications must be accompanied by a detailed, color coded legible line drawing of the milking system indicating the following items when present, in addition to the items required in the application form DMC 1517.

33. AMI Location	35. Positive Air Ventilation System	37. Operator Traffic Flow	39. Water protection
34. Milk Storage	36. Check Valves	38. Milk Line Air Blow Assemblies	40. Milk tank blocking valves layout

The application form is very specific with regard to what information must be attached to each application.

With regard to the PMO Appendix Q and M-I-14-8 the following is offered as further clarification:

Compressed Air Systems

All air blow assemblies for milk line evacuation on all automatic milking units must be equipped with a disposable point of use filter in accordance with Appendix H of the most current revision of the PMO. This would be a filter located at the air blow assembly. An easily accessible location must be considered for any air blow added to a unit during the installation to allow for inspection and maintenance. Replacement filters must be stored convenient to the operation and to preclude contamination.

Cleaning Systems and Hot Water

Most AMI units have on-board water heating capabilities for washing the automatic milking unit and the milk line to the milkhouse. In

most cases, a separate water heating system and wash system is needed for cleaning the bulk milk storage tank. Hot water requirements and water heating capacity information must be attached to all applications as requested in the DMC 1517 application.

Separation of Milk and CIP Solution (Fail Safe Valve System)

A detailed schematic showing the layout of the fail safe valve set-up at the bulk milk storage tank must be submitted with the application.

The layout schematic submitted shall be for the particular installation that application is being submitted for and not a generic suggested manufacturer's design.

Operation of all fail safe valve systems must be verified through testing by the installer or manufacturer's technician in consultation with the Certified Milk Inspector and representatives of the Division of Milk Control.

The use of butterfly valves is prohibited in the block and bleed system design. These valves are not approved for CIP cleaning.

Positive Ventilation Air

Item 12r of Appendix Q of the PMO requires that positive ventilation air be supplied to the automatic milking unit room.

The ventilation system is required to operate whenever the system is cleaning (including full system washes and partial washes) and may need to run during milking to minimize odor, dust and/or pests.

The air for this system shall come from outside the cattle housing area and shall be as clean and dry as practical.

It will be necessary for the installer and / or the producer to design and install a system which provides greater air pressure within the automatic milking unit room than that of the animal housing or free-stall area.

A detailed drawing and description of such a system must be submitted with the application.

At this time there is no singular system guidance for how a positive air ventilation system should be designed. However, from continual review of systems and research we have found that systems designed for less than 40 air changes per hour (ACH) are not adequate. See Appendix C for formulas to determine ACH.

Inspectional Areas of Concern

The installer or manufacturers technician must review the inspection procedures and testing procedures for the AMI system in use with the cooperative's Certified Milk Inspector. This training must include which areas of the unit may be disassembled and / or tested, without a technician present, during routine inspections. These areas should be documented.

AMI Documentation

There are several documents that must be available at the producer facility for review by Regulatory agencies. It is recommended that a binder of information be created and made accessible. It is also acceptable to create an electronic file so long as it is accessible to the Certified Milk Inspector without the producer or manufacturer technician present. The following needs to be available:

The FDA issued M-I document specifying acceptance of the teat preparation protocol for the AMI unit.

The manufacturers testing and verification procedures for each of the fail safe valve system arrangement(s).

Instructions for accessing milk storage temperature records and equipment cleaning records. These instructions should include screen shots and key stroke instructions where appropriate.

The milk hauler pick up procedure. These instructions should also include screen shots and key stroke instructions where appropriate.

Direct Tanker Loading Operations

Direct tanker loading is that process whereby milk is directly loaded onto a transportation tanker from the milking system through by-passing the use of a farm bulk milk tank(s) and / or silo(s).

All equipment installed and facilities constructed for use in direct tanker loading operations shall meet all the applicable requirements of Section 7, particularly Item 5r and Appendix B of the PMO as well as those found in this document.

Applications for Installation

The DMC 1517 as well the DMC 1543 Supplemental Application for Direct Tanker Loading Milking Operation must be completed in full.

All applications must be accompanied by a detailed, color coded legible line drawing of the milking system indicating the following

items when present, in addition to the items required in the application form DMC 1517:

21. Tanker Pad	24. Cooling Media Sample Port	27. Indicating Thermometer	30. Sampling Device
22. Dock Seal	25. Check Valves	28. Recording Thermometer	31. Milk Weight Flow Meter
23. Milk Transfer Hose(s)	26. Milk Line Air Blow Assemblies	29. Recording Device	32. Sample Storage

Exterior Conditions

Park the tanker on a surface constructed of concrete or other equally impervious material. The weight of a full trailer of milk should be considered when designing the surface where the feet of the trailers will be located.

Size the parking surface to extend from the building to under the front feet of the tanker (minimum requirements).

Slope the surface to provide adequate drainage. Considerations must be made to prevent pooling of water and leaked or overflowed milk. Trench drains located along the building at the back of the tanker and proper placement of hose stations have been used successfully to address this.

Waste should be captured in a manner that prevents contamination of the surrounding environment and is handled in a manner acceptable to the local municipality.

Tanker Connections

The PMO allows for the direct loading of bulk milk tankers with or without overhead protection of the tanker. Please refer to Item 5r of the most current revision of the PMO for further details on the minimum criteria to be met.

When the option of no overhead protection is utilized, the tanker must be parked against a properly designed door seal. This seal must prevent direct openings into the milk house.

All milk hose connections must be accessible to, and made from within, the milk house.

The State of NY allows the connection to be made outside when adequate overhead protection is provided over the back of the tanker where the connection is made. Adequate covering is considered a roof or

overhang that extends no less than 8 feet from face of the building. The cabinet on the back of the tanker is not considered adequate protection.

When this option is utilized and the milk line is stubbed out of the milk house, the CIP return loop must be made as short as possible and this loop must be hard piped. Provisions must be made for the flexible transfer hose to be washed and hung off the floor for storage inside the building or within an enclosure found to be acceptable by the CMI and NYS Dept. of Agriculture & Markets.

Means shall be provided to properly wash the check valve assembly used for filling each tanker.

Milk Cooling

Milk shall be cooled to 45°F (7.2°C) or colder prior to it entering the tanker.

Provide all BTU removal requirements and total cooling capacity for the proposed cooling system with the submitted application.

Properly design and operate the cooling media system to prevent contamination of the milk supply.

Water used to cool the milk supply shall be from a safe and approved source.

Use food or pharmaceutical grade coolant additives that are non-toxic and comply with 21 CFR 184.1666.

Provide a sanitary sampling port or other sampling access to the cooling media system.

Install a milk temperature recording thermometer probe downstream from the heat exchanger in a sanitary well in the milk line.

Recording thermometers and / or electronic temperature recording systems must be installed in accordance with Item 18r of the most current revision of the PMO.

Install a milk temperature indicating thermometer as close as possible to the temperature recording probe to verify accuracy of the recording thermometer.

There shall be a means provided to check thermometers for accuracy.

A Standard Operating Procedure (SOP) outlining the procedure for making such accuracy checks must be developed by the CMI representing

the milk cooperative and approved by the Dept. of Agriculture and Markets.

Thermometers must be verified for accuracy (within $\pm 2^{\circ}\text{F}$) every six months by the dairy cooperative CMI and properly documented (document in a log or on chart) and this documentation must be maintained on file at the farm for review by regulatory agencies.

A suggestion is to maintain a small jar or vial of mineral oil in the sample refrigerator that can be utilized by the CMI to conduct temperature verifications when milk is not running through the milk line.

The NYS Department of Agriculture & Markets allows the digital readout on the chart recorder to be considered as an indicating thermometer, as per FDA M-I-03-13.

Milk Sampling at the Farm

All persons responsible for obtaining milk samples to be used for regulatory purposes must hold a NYS Milk Receiver's License from the NYS Dept. of Agriculture & Markets, Division of Milk Control.

The milk shall be sampled in a manner to preclude contaminating the milk tanker or the milk sample.

Sampling at the farm must be done according to a properly prepared Standard Operating Procedure (SOP).

Milk samples may be obtained directly from a properly agitated tanker located in a suitable shelter. The suitable shelter shall meet the construction, lighting and drainage requirements of a milkhouse. The milk tanker shall be agitated in accordance with the criteria outlined in Standard Methods for the Examination of Dairy Products, Section 3.042 B.

Alternatively, milk samples may be obtained by use of an approved in-line milk sampling device installed on the milk pipeline system. In-line sampling devices must be an approved device, installed and maintained as outlined in the FDA document M-I-06-6.

Detailed SOPs must be submitted and approved by the CMI and the NYS Dept. of Agriculture & Markets for that sampling method which is utilized. SOPs should be drafted and submitted for review will in advance of the start of any operation in expectation that several drafts may be necessary before final approval.

The FDA document M-I-06-6 contains generic SOPs for the three validated and accepted in-line sampling units. These SOPs may be used as a base SOP with necessary edits made to create a SOP unique to the operation being proposed.

All persons responsible for the collection of samples must be trained by the CMI and licensed by this Dept. as stated above.

This SOP must also outline the proper cleaning, sanitizing and maintenance of any in-line sampler in use.

Anyone responsible for maintaining or cleaning a sampler, including anyone changing sample needles, bags, bottles, etc., must be trained according to this SOP.

All training must be documented and on file at the producer facility.

An area within the milk house should be considered for a sampling station to allow proper taking of samples. See section on Milk house considerations.

Methods and Means to Determine Milk Weight

The methods and means that will be used to determine the weight of the milk on the milk tank truck will be specific to each installation. Each individual installation protocol shall include a description of the method and means used to make this determination.

The following is provided by the NYS Dept. of Agriculture & Markets Bureau of Weights & Measures to establish the requirements when using an in-line flow meter to measure official milk weights on the farm.

Direct bulk milk metering systems used for commercial transactions shall meet the following requirements:

The measuring device shall meet the type approval requirements as described in 1 NYCRR part 220.1.

The appropriate municipal director of weights and measures is notified before use.

The measuring device and related accessories shall be installed, tested and maintained as per the requirements of National Institute of Standards and Technology (NIST) Handbook 44 "Specifications and Tolerances for Commercial Weighing and Measuring Devices". These requirements include:

1. Installation in accordance with the manufacturer's instructions, including instructions marked on the device. Installation must be

in a fixed location so that neither its operation nor its performance will be adversely affected by the foundation, supports, or any other detail of the installation.

2. A primary indicating element. In NYS it is customary to purchase and sell milk by the pound based on 8.6 lb. /gal, therefore, the indicating element should display in pound units.
3. Effective vapor elimination, automatic in operation, to ensure air is eliminated from the milk before passing through the measuring device.
4. The vapor eliminator must be positioned or installed such that it cannot be easily emptied between uses and maintains a flooded condition during measurements.
5. A provision for security (e.g. data change audit trail) or for applying a physical security seal.
6. An adequate provision to ensure no liquid can be diverted from the supply tank to the receiving tank without being measured.
7. An effective provision to ensure the discharge rate is maintained within the maximum and minimum flow rates for the meter.
8. Marking on the air eliminator the volume of product necessary to flood the system, "flood volume", when dry (if applicable).
9. Marking on the primary indicating element and the delivery record the conversion factor (8.6 lb. /gal.).
10. Recording on the delivery ticket, credit for flood volume for each transfer affected.

Notes and recommendations.

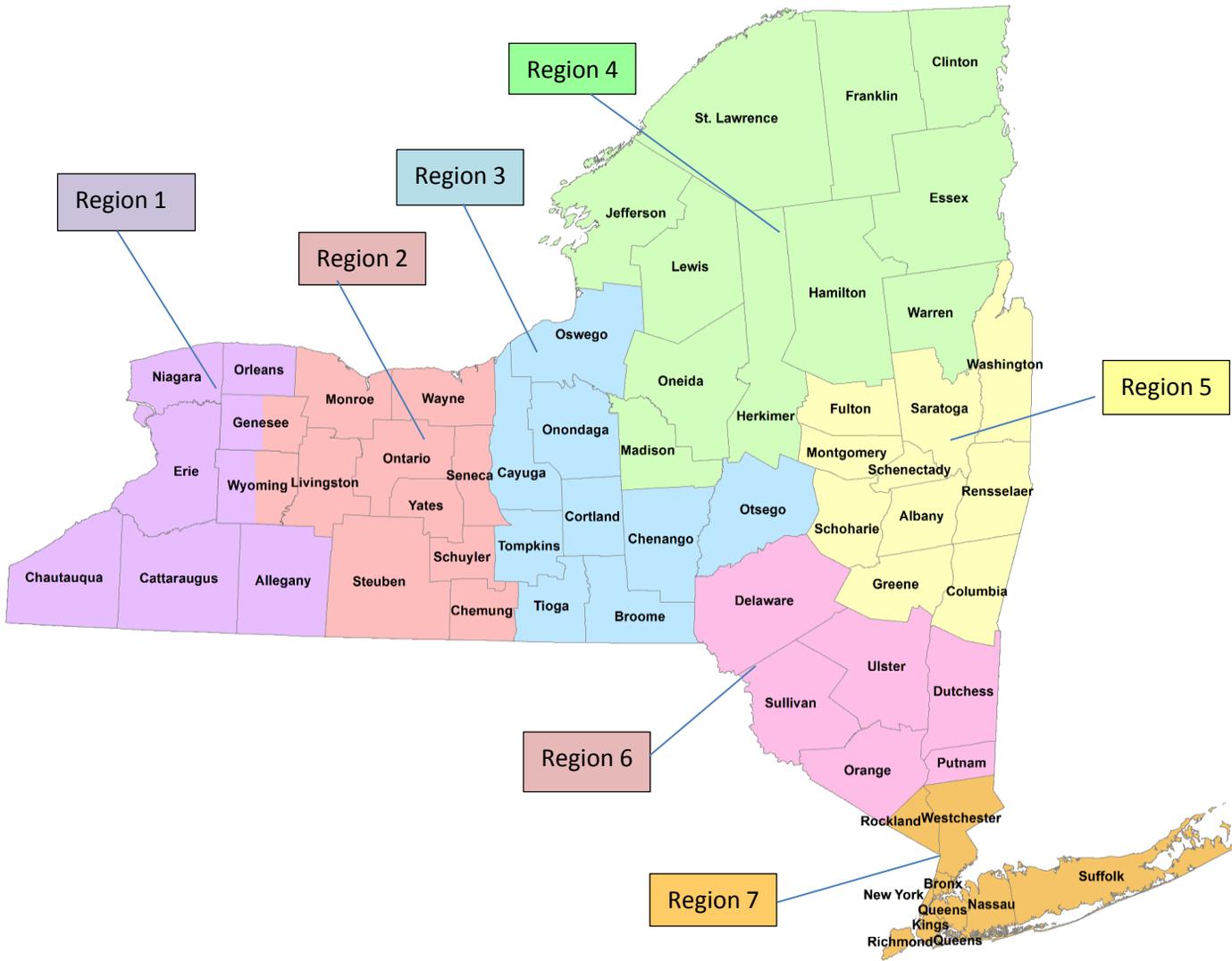
1. Type approved devices used for metering milk include but are not limited to:

Manufacturer	Model/Series	Flow Range	NTEP COC
Conflow Technologies	PD340	3.5 - 50 gpm	06-090
Micro-Motion	2700/3500/3700	12 - 720 gpm	09-033
Anderson Instrument	IZMA/IZMA series	20 - 800 gpm	03-111
Anderson Instrument	RZ	20 - 300 gpm	03-110
Anderson Instrument	RZ-3A	35 - 315 gpm	03-109

2. For information about the National Conference on Weights and Measures (NCWM) Type Evaluation Program (NTEP) visit: www.ncwm.net/ntep/cert_search
3. For a list of New York State type approved devices visit: <http://www.agriculture.ny.gov/WM/WMHome.html>
4. Test Methods: Common test methods include:
 - a. Volumetric: using an appropriately sized volume measure calibrated by an accredited laboratory. The liquid for this test is usually water and the test is typically performed after cleaning; or
 - b. In-Line Volumetric: using an appropriately sized volume measure calibrated by an accredited laboratory. The liquid for this test is usually milk and the test is typically performed during loading. In order to perform this test the system will require tee fittings for connecting to the in-line system; or
 - c. Gravimetric: using a scale inspected and tested by weights and measures; or
 - d. Other methods, as approved by the State Director, may also be used.

Appendix A - Division of Milk Control

Inspectional Regions



Appendix B – Milkline and Vacuum System Sizing Guideline

(Adapted from ANSI/ASABE AD5707:2007 (JAN2011) Milking Machine Installations – Construction and Performance)

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

Table 2 - Recommended minimum sizes for looped pulsator airlines

Number of units	Pipe diameter ¹
1 to 14	50 mm (2 in.)
15 or more	75 mm (3 in.)

¹ metric = nominal ID. inch = US pipe size

3. MAIN AIRLINE SIZING

ASAE Standard S518, Annex B

Vacuum pump capacity L/min free air	Approx. length of main airline (m of straight pipe)			
	5	15	20	25
1500	50 mm	75	75	75
2000	75	75	75	75
3000	75	75	75	100
4000	100	100	100	100
5500	100	100	100	100
7000	100	150	150	150
8500	150	150	150	150
10000	150	150	150	150

Vacuum pump capacity ft ³ /min free air	Approx. length of main airline (feet of straight pipe)						
	10	20	40	60	80	100	200
50	2 in.	2	3	3	3	3	3
70	3	3	3	3	3	3	3
100	3	3	3	3	4	4	4
150	4	4	4	4	4	4	4
200	4	4	4	4	4	4/6	6
250	4	4	6	6	6	6	6
300	6	6	6	6	6	6	6
400	6	8	6	6	6	6	6

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.

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

Nominal mi kline size	Maximum number of units per slope				
	Slope				
	0.8%	1.0%	1.2%	1.5%	2.0%
48 mm (2 in.)	2	3	3	4	5
60 mm (2.5 in.)	6	6	7	9	10
73 mm (3 in.)	11	13	14	16	19
98 mm (4 in.)	27	30	34	38	45

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.

nominal mi kline size	Maximum number of units per slope				
	Slope				
	0.8%	1.0%	1.2%	1.5%	2.0%
48 mm (2 in.)	1	1	2	2	3
60 mm (2.5 in.)	4	4	5	6	8
73 mm (3 in.)	9	10	12	13	16
98 mm (4 in.)	24	27	31	36	41

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.

Nominal mi kline size	Maximum number of units per slope			
	Slope			
	0.8%	1.0%	1.2%	1.5%
48 mm (2 in.)	2	3	3	4
60 mm (2.5 in.)	6	9	*(9)	*(9)
73 mm (3 in.)	*(9)	*(11)	*(13)	*(16)

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.

Sheep / Goat Milking System Sizing Guidelines

System	Cubic Feet Per Minute (CFM) (ASME)	Liters Per Minute (LPM)
Bucket Systems : Base	10	280
Per Milking Unit additional	2	56
Vacuum Dumping Station	5	140
Pipeline Systems : Base	25	700
Per Milking Unit Additional	2	56

Pipeline systems require more vacuum to wash than to milk under many circumstances given the reduced airflow per unit needs of the two (2) teat cup claws used in small ruminants. The following is a chart for the minimum airflow needed to wash different size milk lines.

Minimum Vacuum for Cleaning*

Line Size	CFM	LPM
1.5"	25	700
2.0"	40	1120
2.5"	60	1680

* for each loop of pipeline, every additional loop will require approximately 50% more airflow

Main Vacuum Line Sizing

Pump Capacity	Length of Main Airline	Size of Line Required
50 CFM	< 60 feet	2 inch
50 -125 CFM		3 inch
> 150 CFM		Check Manufacturer

Pulsation Lines

2 inch line	Up to 35 units
3 inch line	36 or more units

Best Guidance to Date: Field Studies Still On-Going Number of Milking Units per Line Slope Inches of Slope in 10'

Nominal Line Size	1" (.8%)		1.25" (1%)		1.5" (1.2%)		1.75" (1.5%)	
	Goats	Sheep	Goats	Sheep	Goats	Sheep	Goats	Sheep
1.5"	3	5	4	6	4	8	5	9
2.0"	6	10	8	12	10	16	12	16
2.5"	12	24	14	24	16	28	18	32

Appendix C - Air Change Rates for AMI Systems

To determine the fan capacity in cubic feet per minute (cfm) to gain 40 ACH in a particular AMI room, multiply the length times the width times the average ceiling height, all in feet, to obtain the volume. Divide the volume by one and one half (1.5) to obtain the minimum continuous capacity of forty (40) air changes per hour in cfm (1.5 x 40 = 60 minutes).

$$(W \times L \times H) \div 1.5 = \text{cfm}$$

For Example: Room width 12', length 20' and average ceiling height 8'.

$$(12 \times 20 \times 8) \div 1.5 = 1280 \text{ cfm fan to gain 40 ACH}$$

To determine ACH based on fan capacity:

$$\text{ACH} = 60 \times \text{fan CFM} \div \text{volume of room}$$

For Example: Fan capacity of 2500 cfm, room size of 3000 ft³.

$$\text{ACH} = 60 \times 2500 \div 3000$$

$$\text{ACH} = 50$$

Appendix D - Various Manufacturers of Backflow Preventers and Applications.

ASSE 1001 PIPE APPLIED ATMOSPHERIC VACUUM BREAKER

MANF.	MODEL NO.
WATTS	288A
WILKENS	35
FEBCO	710 & 715
CONBRACO	38-100 & 38-200
CASH-ACME	V-101



ASSE 1011 HOSE CONNECTION VACUUM BREAKER

MANF.	MODEL NO.
WATTS	8, 8A, 8AC, 8B, 8BC, 8C, NF8, NF8C, 8P, 8FR
WILKENS	BFP-8 & BFP-8F
CONBRACO	38-304, 38P, 38-400, 38-404
CASH-ACME	V-3, V-4, VB-222
FABCO	731 series
DANFOSS	HB8



ASSE 1012 BACKFLOW PREVENTER WITH INTERMEDIATE VENT

MANF.	MODEL NO.
WATTS	9-D
WILKENS	750
FEBCO	815
CONBRACO	40-400 & 4J-400
CASH-ACME	BFP
DANFOSS	8200



ASSE 1013 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER

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



ASSE 1019 VACUUM BREAKER WALL HYDRANTS

MANF.	MODEL NO.
WATTS	HY-42, HY-42B, FHB-1 & FHB-2
WILKEN	Z1300 series



ASSE 1020 PRESSURE VACUUM BREAKER ASSEMBLY

MANF.	MODEL NO.
WATTS	800
WILKENS	420, 720A
FEBCO	765, 765U
CONBRACO	40-500, 4V-500,
FLOMATIC	PVB



ASSE 1052 HOSE CONNECTION BACKFLOW PREVENTER

MANF.	MODEL NO.
WATTS	N9-CD
CONBRACO	38-304-02
NIDEL	38HD
WILKINS	Z-1399



ASSE 1056 BACK SIPHONAGE VACUUM BREAKER

MANF.	MODEL NO.
WATTS	008
CONBRACO	4W-500



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.

STD.	HAZARD	LIMITATIONS
ASSE 1001	HIGH	NO VALVES AFTER, NO BACK PRESSURE, 12 HR. MAX.
ASSE 1011	HIGH	NO VALVES AFTER, 12 HR. MAX.
ASSE 1012	LOW	
ASSE 1013	HIGH	
ASSE 1020	HIGH	NO BACK PRESSURE
ASSE 1052	HIGH	NO VALVES AFTER, 12 HR. MAX.
ASSE 1056	HIGH	NO BACK PRESSURE
ASSE 1055	HIGH	

Backflow Prevention Guide For Potable water Applications

Hazard/Equipment	Approved devices or methods ²						Comments
	Air gap ANSI std.	ASSE 1013	ASSE 1001 ¹	ASSE 1012	ASSE 1055	ASSE 1011 ¹ 1056 1019 1052 ¹	
Pasteurized product lines w/out cleaning solution	X	X		X			
Raw product lines w/cleaning solution	X	X	X				
Animal watering tanks	X	X	X			X	
Cooling water w/out additives	X	X	X	X			
Reclaimed water (low hazard)	X	X	X	X			
Reclaimed water (high hazard)	X	X	X				
Chemical injector or proportioner	X	X			X		Per alternate approval or adopted standard
Boiler w/non-toxic additives	X	X		X			
Boiler w/ toxic additives or pot feeder	X	X					
Separator bowl installed downstream of pasteurization	X	X		X			
Separator bowl installed upstream of pasteurization	X	X					
Homogenizer	X	X					
Pump seals (open)	X	X	X	X			
Portable pressure washer	X	X				X	
Permanent pressure washer	X	X					

¹ No valves downstream of the device.

² Also see manufacturers limitations for devices.