Foundation for Cross-Connection Control and Hydraulic Research

USC

inside: **field evaluation sites / eyewash / check valve discs... and more**

Cross Talk

Autumn 2007

Protection- Irrigation Systems

The Foundation receives several questions about irrigation systems throughout the year, many regarding the type of protection that the Foundation recommends.

Irrigation systems, may be equipped with pumps, injectors, pressurized tanks or vessels or other equipment for injecting agricultural chemicals such as fungicides, pesticides or soil conditioning chemicals into the irrigation systems. However, even irrigation systems without any additives are considered a health hazard and require the use of a backflow preventer acceptable for protection against health hazards.

Pooling around sprinkler head that may contain hazardous material

Many believe that installing a double check valve backflow prevention assembly is sufficient protection for irrigation systems. Keep in mind, a double check should only be used to protect against a non-health hazard (i.e., water which may be affected aestheti-

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USC **Viterbi** School of Engineering

Foundation Membership

The Foundation's Membership Program provides many benefits to the Members of the Foundation. These include: a twenty-five percent discount on manuals, twenty percent discount on Foundation Training Courses for any employee of the Member company/organization, the *List of Approved Backflow Prevention Assemblies*, printed quarterly, and access to the up-to-the-minute version of the List for those Members with Internet access.

Members are encouraged to call the Foundation with technical questions. The Foundation's Engineering Staff is available to assist Members with the various aspects of field testing backflow preventers, installing backflow preventers and administering their cross-connection control program.

Many consider their Membership with the Foundation one of their best forms of insurance to protect the agency from liability involved when a distribution system becomes contaminated or polluted through cross-connections. Membership in the Foundation helps to provide the tools needed to effectively initiate and run a cross-connection control program.

Below is a list of those who have become members of the Foundation this past quarter:

A-Team Plumbing

Backflow Training Services

Bali Construction, Inc.

BGCE

Bromic Pty Ltd

Burleson, City of

California State University-Northridge

Cox Industrial

Fivalco Ltd.

GreenbergFarrow

Harper-Leavitt Engineering

Harumi Kogyo Ltd.

Hesperia Water District

Houston Area Plumbing JAC

Idaho ABPA

Johnny M. Anderson

IMB & Sons

Lancaster Ohio Water Department

Landale Mutual Water Co., Inc.

New Mexico Rural Water

One Day Water Works

Pakpour Consulting Group

Paul Hampton

Penn Air Control, Korea

PennMarVa, Inc.

RJG's Backflow Specialist

R.W. Desrosiers, Inc.

Round Hill General Improvement

Sparta Public Works

Talent, City of

Telamon Engineering

Temecula Engr. Cons., Inc.

Utilities, Inc., Western Regional Office

Yarbrough-Williams & Houle, Inc.

Cross Talk is published by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California for Foundation Members. Limited additional copies are available to Members upon request.

Equipment:
Eyewash | Safety Showers

The Occupational Safety and Health Standards 1910.151(c) states:

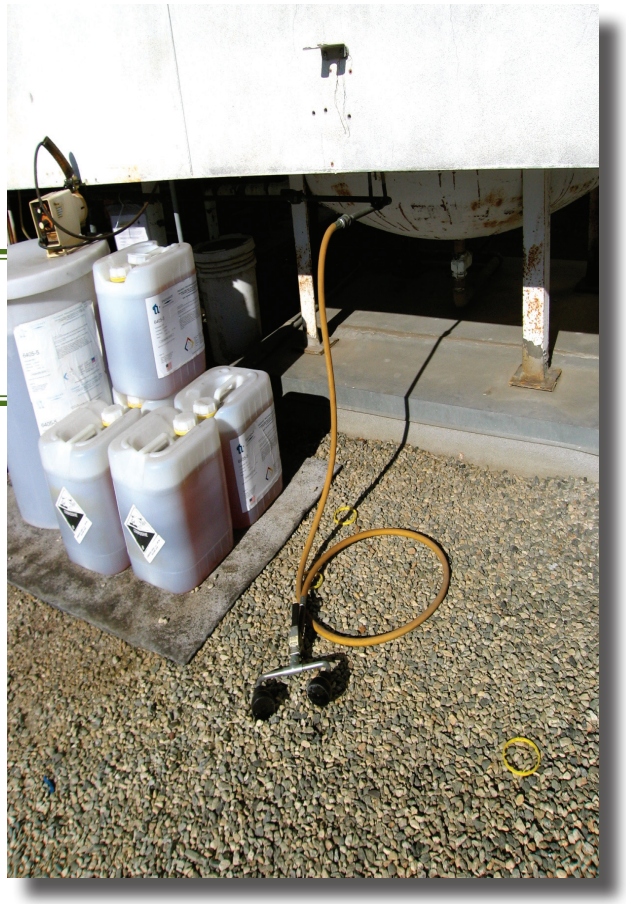
Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

For those involved in cross-connection control, as with all potable water uses, it is important to ensure that the water supplying the eyewash/safety shower is not contaminated by any of the "injurious corrosive materials" to which someone may be exposed. The eyewashes or safety showers are needed in areas where the dangerous materials are present. But the fact that there are dangerous materials present makes a cross-connection to the potable water system more likely.

The **eyewash/safety shower** normally... **does not require** any backflow prevention **protection**.

It is not uncommon to find safety showers or eyewashes tied into a water line, which has a cross-connection to hazardous materials, which are the very reason for the eyewash or safety shower installation.

For example, in a boiler room, one is likely to discover chemical additives for anti corrosion purposes. Chemicals may be added to the boiler system through a chemical pump or a chemical pot. If the water make up line tying into the boiler system is unprotected, the makeup line may become contaminated with the chemicals if a backflow incident occurs. In this case, it may be backsiphonage or backpressure due to the recirculating pressure in the boiler system. Because of the chemicals in the room an eyewash/safety shower will be required. When the eyewash or safety shower is installed, it will tie into the potable water line. If this water line is the same unprotected line feeding the boiler for make-up water, which is very likely, the water feeding the eyewash/safety shower could be supplied with water contaminated by the very chemicals that the eyewash/safety shower is there to wash away. For the cross-connection control specialist conducting a site survey, it is important to realize that, although the eyewash/safety shower may indicate that there is a hazard present, the eyewash/safety shower is not the hazard. It is simply another water use that requires potable water. Some have become aware of the hazards of a cross-connection tied in to the water supply of the eyewash/safety shower, and incorrectly considered the eyewash/safety shower as the hazard against which protection is needed. But the eyewash/safety shower, is no more a hazard than a drinking fountain (assuming they are all correctly plumbed) and,



Eyewash station with potential hazardous material

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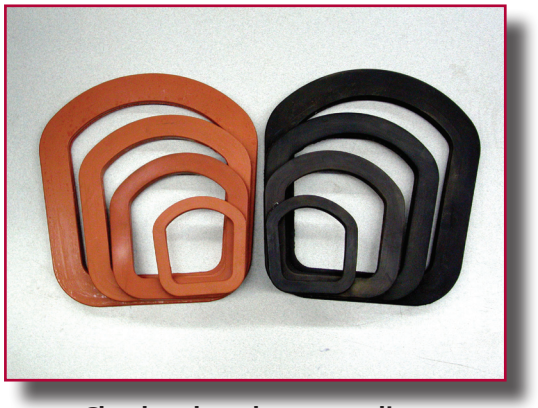
CheckValve Elastomer Discs

In response to inquiries received by the Foundation, the table shown here has been compiled, which details the check valve elastomer disc material currently approved by the Foundation in each of the respective backflow prevention assemblies. Some field personnel are under the impression that either of the check valve disc materials (i.e., black EPDM or orange Silicone) may be used in a particular model and size assembly.

In order for each of the models listed below to maintain the Foundation's approval, field personnel must be sure to install the approved check valve disc material.

Should you require any additional information regarding the Foundation's approval, please contact the Foundation Office. ■



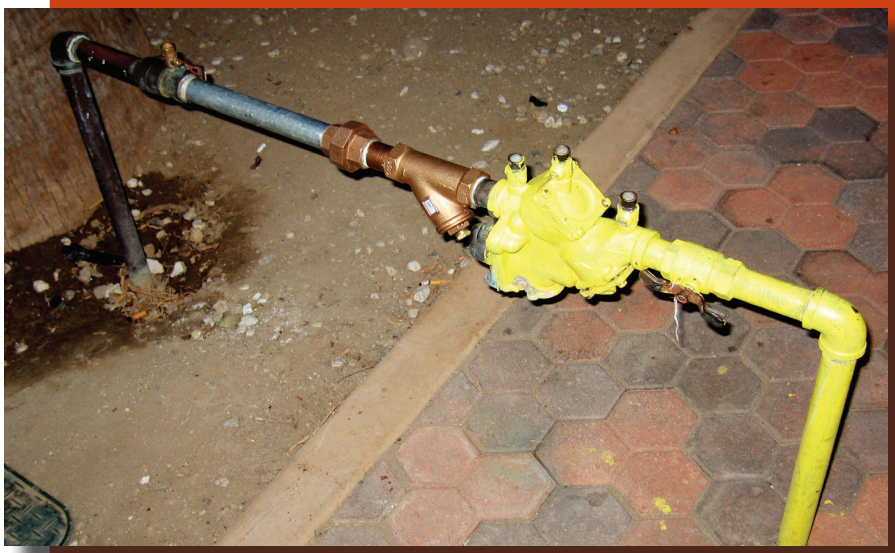
Check valve elastomer discs

Type	MFG	Model	Private Label MFG	Private Label Model	Size	Material of Check Discs
DC	Ames	Colt 200	Watts	757	2 1/2, 3, 4, 6, 8	Orange Silicone
DC	Ames	Colt 200a	Watts	757a	2 1/2, 3, 4, 6	Black EPDM
DC	Ames	Colt 200Na	Watts	757Na	2 1/2, 3, 4, 6	Black EPDM
DC	Ames	Maxim 200	Watts	767	2 1/2, 3, 4, 6	Orange Silicone
DC	Ames	Maxim 200a	Watts	767a	2 1/2, 3, 4	Black EPDM
DC	Ames	Maxim 200Na	Watts	767Na	2 1/2, 3, 4	Black EPDM
DCDA	Ames	Colt 300aBF	Watts	757aDCDABF	2 1/2, 3, 4, 6	Black EPDM
DCDA	Ames	Colt 300aGV	Watts	757aDCDAGV	2 1/2, 3, 4, 6	Black EPDM
DCDA	Ames	Colt 300BF	Watts	757DCDABF	2 1/2, 3, 4, 6, 8	Orange Silicone
DCDA	Ames	Colt 300GV	Watts	757DCDAGV	2 1/2, 3, 4, 6, 8	Orange Silicone
DCDA	Ames	Maxim 300aBF	Watts	767aDCDABF	2 1/2, 3, 4	Black EPDM
DCDA	Ames	Maxim 300aGV	Watts	767aDCDAGV	2 1/2, 3, 4	Black EPDM
DCDA	Ames	Maxim 300BF	Watts	767DCDABF	2 1/2, 3, 4, 6	Orange Silicone
DCDA	Ames	Maxim 300GV	Watts	767DCDAGV	2 1/2, 3, 4, 6	Orange Silicone
RP	Ames	Colt 400	Watts	957	2 1/2, 3, 4, 6	Black EPDM
RP	Ames	Colt 400	Watts	957	8	Orange Silicone
RP	Ames	Colt 400BFG			4, 6	Black EPDM
RP	Ames	Colt 400N	Watts	957N	2 1/2, 3, 4	Black EPDM
RP	Ames	Colt 400Z	Watts	957Z	2 1/2, 3, 4	Black EPDM
RP	Ames	Maxim 400	Watts	967	2 1/2, 3, 4	Black EPDM
RP	Ames	Maxim 400	Watts	967	6	Orange Silicone
RP	Ames	Maxim 400N	Watts	967N	2 1/2, 3	Black EPDM
RP	Ames	Maxim 400Z	Watts	967Z	2 1/2, 3	Black EPDM
RPDA	Ames	Colt 500-GV	Watts	957RPDA-GV	2 1/2, 3, 4, 6	Black EPDM
RPDA	Ames	Maxim 500-GV	Watts	967RPDA-GV	2 1/2, 3, 4	Black EPDM

Installations | Strainers

The Foundation regularly receives inquiries regarding the use of strainers on backflow prevention assemblies. Strainers are used in water lines to strain out particles, such as sand and debris. A "Y" strainer is basically a Y-shaped fixture. The water flows in and through the screened portion of the strainer and out through the outlet. The strainer can be cleaned by opening the outlet on the one leg of the strainer and emptying out the sand and debris which has been trapped by the strainer.

Strainers can be very useful in protecting backflow preventers from becoming fouled due to debris in the water line. Many water agencies, or property owners will install strainers upstream of backflow preventers in order to minimize fouling of the assemblies and thus minimizing repairs on the backflow preventers.



Strainer incorrectly installed downstream of the No. 1 shutoff valve, but upstream of the body of the backflow preventer

Installing strainers upstream of backflow preventers is not a problem. There is a problem, however, when the strainer is installed downstream of the No. 1 shutoff valve, but upstream of the body of the backflow preventer. The Manual of Cross-Connection Control, Ninth Edition, Section 10.1.1.6 states:

All assemblies, which consist of independent units assembled for the purpose of preventing backflow, shall comply with the material, the operational and other specifications as required for backflow prevention assemblies. In order to ensure proper installations, all backflow prevention assemblies shall be delivered from installation completely assembled by the original manufacturer with all components as approved. Resilient seated shutoff valves and test cocks are considered integral parts of the assembly.

It may be convenient to install the strainer downstream of the No. 1 shutoff valve, the excerpt above makes it clear that strainers cannot be installed between the No. 1 shutoff valve and body of a backflow prevention assembly without invalidating the Foundation's approval. But, an assembly could be granted Foundation approval with an integral strainer, providing that it has been submitted for evaluation and passed all the performance test. Although past results have found that the assembly cannot comply with the feed loss requirements with integral strainers.

The Foundation has no objections to the use of strainers. They can be very useful to minimize fouling of the assemblies, especially where water conditions may be harsh. But if strainers are installed on backflow prevention assemblies, they need to be installed upstream of the No. 1 shutoff valve in order to keep the Foundation approval intact. ■

FieldEvaluation Sites

The Foundation's Approval Program is a very thorough examination of backflow prevention assemblies that Foundation members can participate in. The Approval Program consists of two parts: the laboratory evaluation phase and the field evaluation phase.

During the laboratory phase of the Approval Program, the Foundation works closely with the manufacturer of the backflow prevention assembly. The field phase of the Approval Program allows the field units to be tested under realistic conditions, where assemblies may be subjected to different hydraulic conditions such as backsiphonage, backpressure, water hammer, cycling and a variety of other water conditions.

Foundation Staff testing an assembly at a field location

The Foundation is always looking for field locations in which to install backflow prevention assemblies that are currently under evaluation. As a participant, in the field phase, members may be eligible to receive a backflow preventer free-of-charge installed on the premise with some provisions.

The Foundation maintains a list of contacts for locations that it shares with manufacturers for possible sites. The manufacturer is responsible for location acceptable sites; however, the Foundation is permitted to reject any field evaluation site submitted by the manufacturer if the field location criteria aren't met (please reference 10.2.1.3, Manual of Cross-Connection Control, 9th Edition for field location criteria). A few of the criteria that need to be met in order to be considered for a possible field-test location are that the sites provide a wide range of water conditions, are freely accessible during normal working hours and are suitably protected from freezing conditions or vandalism.

At the present time the Foundation's majority of field locations are in California but the Foundation would like to remind members that sites could be located anywhere in the United States. Keep in mind it's the manufacturer's responsibility to install the assembly and provide transportation for the Foundation staff to field-test it.

If you have any questions or are interested in providing a possible field site location the Foundation encourages you to contact us at our website http://www.usc.edu/fccchr or e-mail the Foundation's Field Evaluation Coordinator, John Cornett at the Foundation laboratory, cornett@usc.edu. ■

Eyewash/SafetyShowers: continued

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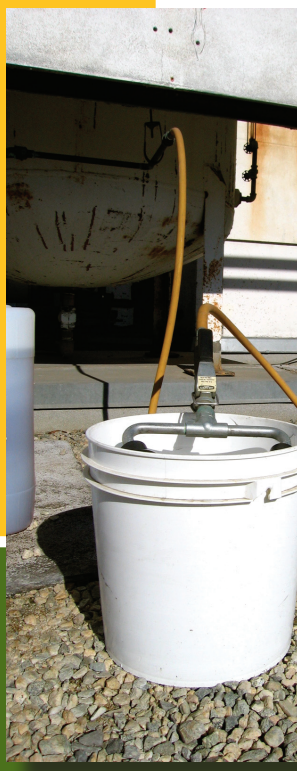
therefore, does not require any backflow protection. The backflow protection is needed on the water makeup line feeding the boiler.

Of course the boiler is just an example. There are all types of water using equipment that may use chemicals or even be in an area with chemicals and thus have the requirement for an eyewash/safety shower in the immediate area. So an eyewash/safety shower is not, normally,



Eyewash submerged may contain hazar

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cally but does not create a hazard to public health). Unfortunately, when dealing with irrigation systems the hazard is more than just an aesthetic concern.

Aside from the additives to irrigation systems mentioned above, irrigation systems are still considered a health hazard. Water may gather around sprinkler heads in the irrigated ground, whether it is a school, park, sporting facility, etc. This water pooling around the sprinkler head becomes contaminated with anything on the ground's surface. This includes fecal matter from animals and any other contaminants found on the ground. It is impossible to control the quality of water that pools on a field exposed to the elements. It is, therefore, absolutely necessary to consider the quality of water that may pool around sprinkler heads to be a health hazard, whether or not chemicals are added to the irrigation system.

It is the Foundation's recommendation that an approved backflow prevention assembly (RP, air gap, PVB, SVB, AVB) be installed on each service connection to premises on which there is an irrigation system and/or at the point of water use (the shutoff valve feeding the irrigation system).

An air gap may be used to protect against an irrigation system, however, an air gap may be impractical at times because of the loss of pressure once the water flows through the air gap. For ditch irrigation systems, the air gap is ideal, since gravity supplies the force needed to distribute the water through the system.

A reduced pressure principle assembly is needed for an irrigation system, which may be subject to backpressure. This may be because of injection systems using pumps, or simply the elevation of a system (a system feeding uphill for example).

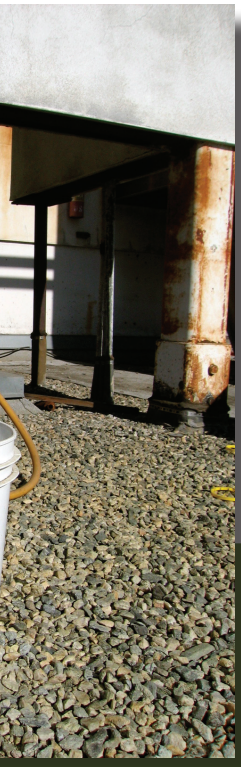
A pressure vacuum breaker (including the spill resistant vacuum breaker) should be used to protect against irrigation systems, which are not subject to backpressure, but may be under continuous pressure. This means there may be shutoff valves downstream of the backflow protection.

An atmospheric vacuum breaker may be used to protect against irrigation systems, which are not subject to backpressure, and which do not have any shutoff valves or obstructions downstream of the backflow protection.

In all cases it is important that proper installation guidelines are followed: RPs should be installed between 12" and 36" above grade; pressure vacuum breakers (including the SVB) should be installed at least 12" above all downstream piping and outlets; and, atmospheric vacuum breakers should be installed at least 6" above all downstream piping and outlets.

For more information you can reference the Manual of Cross-Connection Control, 9th Edition, Section 7.2.3.16 for Irrigation Systems.

If you have anymore questions feels free to contact the Foundation office or e-mail at fccchr@usc.edu. ■



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a cross-connection hazard at all. However, it may be an indication that there is a hazard in the area. When a cross-connection control specialist comes across an eyewash/safety shower, the specialist should consider what hazards are in the area and determine if the potable water is cross-connected to the hazards. If it is, it is likely to be connected to the eyewash/safety shower as well.

The specialist should be aware of the fact that there are some eyewashes that may actually pose a cross-connection risk. These eyewashes are spray eyewash nozzles on the end of a hose. This would pose the same risk as any hose and would therefore require backflow protection. ■

USC

Training Courses

Tester Course

Los Angeles, CA
14-18 January 2008

Los Angeles, CA
5-9 May 2008

Los Angeles, CA
14-18 July 2008

Specialist Course

Los Angeles, CA
7-11 January 2008

Los Angeles, CA
28 July-1 August 2008

Upcoming Events

Univ. of Florida TREEO
Annual CCC Conference
Daytona Beach, FL
27-29 February 2008

California Environmental Health Assoc.
Annual Educational Symposium
San Diego, CA
24-28 March 2008

ABPA International Conference &
Trade Show
Indianapolis, IN
19-21 May 2008

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