

## The Foundation's Approval vs. Other Agencies' Listings

### A Detailed Look at Different Evaluation Processes

The Foundation office receives many inquiries regarding the various listings or approvals available for backflow prevention assemblies. In particular, "how does the actual testing differ?"

The Foundation's Approval Program for backflow prevention assemblies is unique from other listing agencies. The major difference is that the Foundation has Laboratory *and* Field Evaluation Phases of the Approval Program, as compared to other listing agencies only requiring compliance with laboratory tests. The Foundation's experience has been that the Laboratory Evaluation determines the general operating characteristics of the backflow prevention assembly under test, but the twelve-month Field Evaluation puts the assembly into actual field conditions. Many variables can be simulated and tested in the laboratory, but the effects of time-in-use have not been successfully simulated in the lab. A recent survey of the Foundation's field evaluation results showed that one third of those backflow preventers which passed the Laboratory Evaluation Phase of the Approval Program and were released to the Field Evaluation Phase did not pass the Field Evaluation the first

time. This is extremely important as some agencies will allow backflow preventers to be installed in their system if they have only passed the Foundation's Laboratory Evaluation Phase of the Approval Program. They assume that the full Approval will follow within the year. Since, in the last two years, one-third of the assemblies released to the field did not pass the field evaluation, there are many unapproved assemblies which have been installed in

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systems which normally require Foundation Approved assemblies. If an assembly does not complete the field evaluation the first time through, it is typically modified,

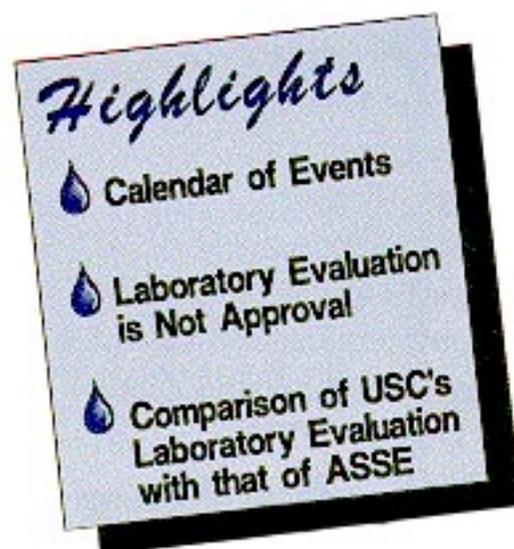
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## Approval vs. Evaluation

### Items Evaluated by the Foundation are not necessarily Approved

Aside from the Foundation's Approval Program, the Foundation also performs specialized testing for various manufacturers of hydraulic equipment. It is important to note, however, that the Foundation does not Approve equipment other than backflow prevention assemblies. The Foundation's Engineering Staff is questioned frequently about certain pieces of equipment. Some people are under the impression that the Foundation Approves items other than back-

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# Membership

The Foundation Membership grew again in this last quarter. The newest Members are listed below. The Foundation encourages Members to take advantage of the many benefits of Foundation Membership. Additional copies of the *Manual of Cross-Connection Control* are available to Members at a 25% discount. Members receive a 20% discount on training courses and 25% discounts on the Training Tools. Members are also encouraged to contact the Foundation office with any questions regarding cross-connection control.

AAA Plumbing  
and Heating  
Town of Addison Utilities  
Arizona Cross Connection  
Arrow Construction  
Services Inc.  
Barstow Unified School  
District  
Burns and Roe Services  
Corporation  
CalResources LLC  
Certified Backflow  
Services  
Cross Tech  
CSU, Bakersfield  
Dave's Quality Plumbing  
Dempsey Construction  
Eastern Municipal Water  
District  
City of Edgewater  
Steven D. Fickle

City of Florence  
Gary Saunders  
Goleta Water Dist.  
Town of Griffith  
Harlan Municipal Utilities  
Hudson Plumbing  
HydroCowl, Inc.  
J.A. Wax Co.  
Jeffrey A. Fasula  
Stan Nikkel  
Town of Payson  
SEARHC/Mt. Edgecumbe  
Hospital  
City of Scottsdale  
City of Solvang  
Standard Wholesale  
Supply Co.  
Town of Taylor  
Town of Addison Utilities  
Waterfront Water Works,  
Inc.  
Yardmaster Enterprises

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# A Detailed Look at Different Evaluation Processes

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reevaluated in the Laboratory and, if every thing tests satisfactorily, released to the field again. But, this assembly has been modified from the original design. Therefore, even if it does eventually gain Approval, the Approved assembly is different than the assembly which originally completed the Laboratory Phase of the Approval Program. This is why it is so important not to allow assemblies to be put into service until Approval has been granted.

The Field Evaluation is not the only difference between the

***The Foundation's Laboratory Evaluation is much more involved than that of other entities.***

Foundation's Approval Program and those of other agencies. The Foundation's Laboratory Evaluation is much more involved than that of other entities.

Should a manufacturer desire the Foundation's Approval for their product, the manufacturer will be directed to the Specifications contained in Section 10 of the Foundation's *Manual of Cross-Connection Control*, currently in its 9th Edition. The Specifications contain design, material, and performance requirements for backflow prevention assemblies, including the:

- Double Check Valve Backflow Prevention Assembly
- Reduced Pressure Principle Backflow Prevention Assembly

- Pressure Vacuum Breaker Backsiphonage Prevention Assembly
- Spill-Resistant Pressure Vacuum Breaker Backsiphonage Prevention Assembly
- Atmospheric Vacuum Breaker Backsiphonage Prevention Assembly
- Double Check Detector Backflow Prevention Assembly
- Reduced Pressure Principle Detector Backflow Prevention Assembly

When assemblies are available to start the evaluation process, the manufacturer must submit product to initiate the Laboratory Evaluation. In conjunction with the Foundation's evaluation, most manufacturers will also request that the Foundation conduct the evaluation required to satisfy other specific listing agencies, such as:

American Society for Sanitary Engineering (ASSE)  
International Association of Plumbing and Mechanical Officials (IAPMO)

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<i>Tester Course</i>	<i>Program Specialist Course</i>
<p><b>Los Angeles, CA</b> 16-20 October 1995 22-26 January 1996</p> <p><b>Las Vegas, NV</b> 18-22 September 1995</p> <p><b>Charleston, SC</b> 6-10 November 1995</p> <p style="text-align: center;"><b>Non-Members \$750.00</b> <b>Members \$600.00</b></p>	<p><b>USC Campus</b> 29 Jan-2 Feb 1996</p> <p><b>Incline Village, NV</b> 18-22 March 1996</p> <p style="text-align: center;"><b>Non-Members \$800.00</b> <b>Members \$640.00</b></p>
<p>Please contact the Foundation office for information on courses in your area or for an application for the next USC Training Course. You may also send a hard copy of a purchase order or a check to the Foundation office to reserve a space. Please be advised that some of these courses fill six to eight weeks in advance.</p> <p>A Purchase Order may be sent via FAX to the Foundation office at (213) 740-8399. Call (213) 740-2032 or E-mail <a href="mailto:fcchr@usc.edu">fcchr@usc.edu</a> for more information.</p>	

## Approval vs. Evaluation

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flow prevention assemblies. The Foundation does not Approve these various pieces of equipment, the Foundation simply evaluates their performance based on the manufacturer's request.

For example, if a fire hydrant manufacturer asked the Foundation to determine what the maximum flow rate through the

***When a technical report is written, the facts of the testing are simply detailed, there is no implication of Foundation Approval, endorsement or acceptance.***

hydrant would be at a given pressure, the Foundation's Engineering Staff would set up the piping, run the evaluation and write a Laboratory Report for the hydrant manufacturing company. This, however, would only be a report detailing the tests performed and the results obtained. When a technical report is written, the data of the testing are simply detailed, there is no implication of Foundation Approval, endorsement or acceptance.

The Foundation has performed tests on various pieces of equipment for various manufacturers. Once the Foundation completes the testing the Foundation issues a Laboratory Evaluation Report. This report details the tests which were performed and exactly what results were obtained. Some have assumed that a piece of equipment has been Approved by the Foundation simply because a Laboratory Evaluation Report was written. This is not the case. (Even when a Laboratory Evaluation Report is written for a backflow prevention

assembly, this does not mean that the assembly is Approved. The assembly may have successfully completed the Laboratory Evaluation, but the assembly must successfully complete the one year field evaluation before it is considered Approved.)

The Foundation may issue a Laboratory Evaluation Report on any piece of equipment. It is important to understand what the Laboratory Evaluation Report states. This report will usually state what tests were performed, what apparatus was used, and the results of the test. These reports

are written as a result of the evaluation in the Laboratory and are not intended for any purpose other than documenting technical evaluation results. Some manufacturers have shown customers the Foundation's Laboratory Evaluation Report on their product. The purpose of this should only be to confirm certain data and facts regarding the test results. This should not be used to imply that the Foundation has found any product to be "acceptable" or Approved. Should there be any questions, the Foundation's Engineering Staff should be contacted. 💧

## Manual Available

**The Ninth Edition of the Manual of Cross-Connection Control is available for purchase. Foundation Members receive a 25% discount from the list price of the Manual. Manual Pricing is as follows:**

<b>Members</b>	<b>\$36.00</b>
<b>Non-Members</b>	<b>\$48.00</b>

**Manuals are typically shipped each Friday. To order Manuals a purchase order or check may be sent to the Foundation office. To expedite the order a purchase order may be sent via FAX. If next day or second day shipping is required, there is an extra fee.**

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## A Detailed Look the USC and ASSE Evaluation Processes

Test	USC Manual of Cross-Connection Control, Ninth Edition	American Society of Sanitary Engineering, 1013-93
<b>Hydrostatic</b>	Twice rated pressure for 10 minutes.	Twice rated pressure for 5 minutes.
<b>Pressure Loss vs. Flow Rate</b>	Flow curve from static to rated flow generated. Pressure loss with increasing and decreasing flows recorded. 200% rated flow for 5 minutes.	Only pressure loss at rated flow required.
<b>Backsiphonage</b>	Both check valves fouled with simultaneous backsiphonage and backpressure conditions applied. No backflow through assembly is allowed.	Both check valves fouled with backsiphonage only. (Pooling of water in the "zone," which could backflow, is not evaluated.)
<b>Thermal Loop</b>	100 hours at maximum rated working water pressure and temperature. Assembly shall function while at rated temperature and pressure.	80 hours at maximum rated working water pressure and temperature. Assembly must withstand temperature, but is not required to function while at temperature.
<b>Relief Valve Drain Funnel Test</b>	Test backflow protection between relief valve discharge port and drain funnel attachment.	N/A
<b>Relief Valve Sensitivity to Opening of Test Cocks</b>	Relief valve shall not discharge when testcocks are fully opened one at a time	N/A
<b>Life Cycle</b>	Assembly shall withstand 5000 cycles without damage or impairment of	N/A

# The Approval Process

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Canadian Standards  
Association (CSA)  
Underwriters Laboratory (UL)  
Factory Mutual (FM)

for their submittal to the other  
agency(s).

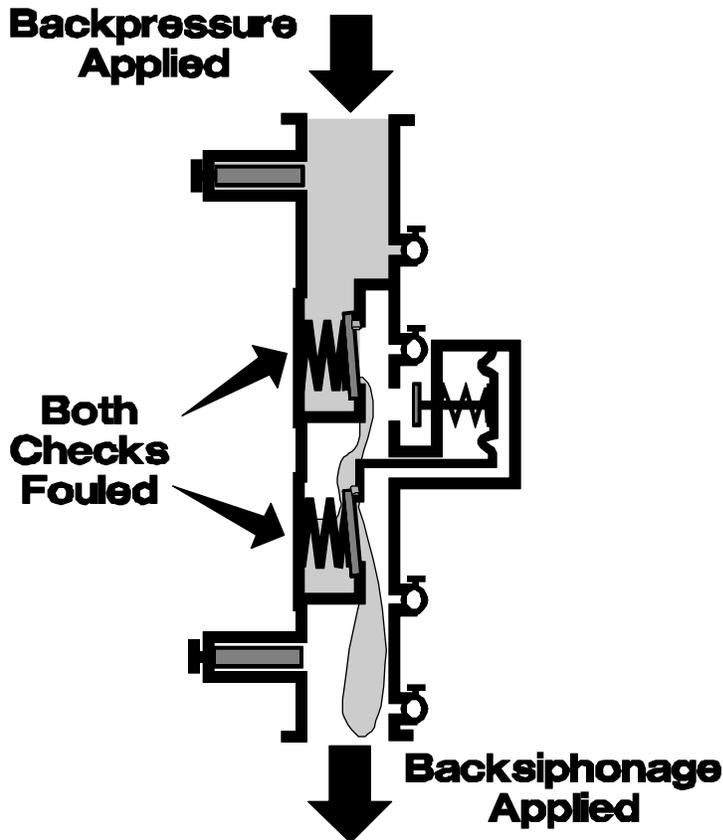
The laboratory tests are  
similar between the listing agen-  
cies, but they are not identical. As

Another issue which is  
becoming more prevalent around  
the country is the installation of  
the assemblies in the vertical  
orientation. The Foundation has  
always allowed for vertical instal-  
lations in the Specifications, As  
long as the assembly is evaluated  
and Approved in the vertical  
orientation. However, none of the  
manufacturers had submitted

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*The Foundation has always  
allowed for vertical installa-  
tions in the Specifications,  
As long as the assembly is  
evaluated and Approved in  
the vertical orientation*

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*Figure 1  
The USC Backsiphonage Test  
for a Vertically Installed RP*

Once the backflow preven-  
tion assembly successfully com-  
pletes the laboratory tests for these  
agencies, then the Foundation's  
Engineering Staff will generate a  
Laboratory Evaluation Report.  
This Laboratory Evaluation  
Report, with respective agency  
forms, is sent to the manufacturer

an example, some of the differ-  
ences between the Foundation's  
Laboratory requirements for a  
reduced pressure principle back-  
flow prevention assembly and  
those of the American Society of  
Sanitary Engineering (ASSE) are  
detailed in the Table on page five.

product for evaluation until recent  
years. Currently several manufac-  
turers have product (i.e., double  
check valve backflow prevention  
assemblies {DC} and double  
check detector backflow preven-  
tion assemblies {DCDA}) under  
evaluation in the vertical orienta-  
tion. An assembly submitted for  
vertical orientation must success-  
fully complete both the Laboratory  
and Field Evaluation Phases of the  
Foundation's Approval Program  
in the vertical orientation.

No reduced pressure prin-  
ciple backflow prevention assem-  
bly {RP} has successfully com-  
pleted the Foundation's backsiphonage test while installed  
vertically. (That is, a horizontal  
unit flipped to run vertically.  
Some RP assemblies which have  
vertical inlet and outlet connec-  
tions with the body components  
horizontal, have passed the back-  
siphonage test.) The water  
backflowing through the fouled

## The Approval Process

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second check valve, pools around the first check valve, and is backsiphoned into the upstream piping.

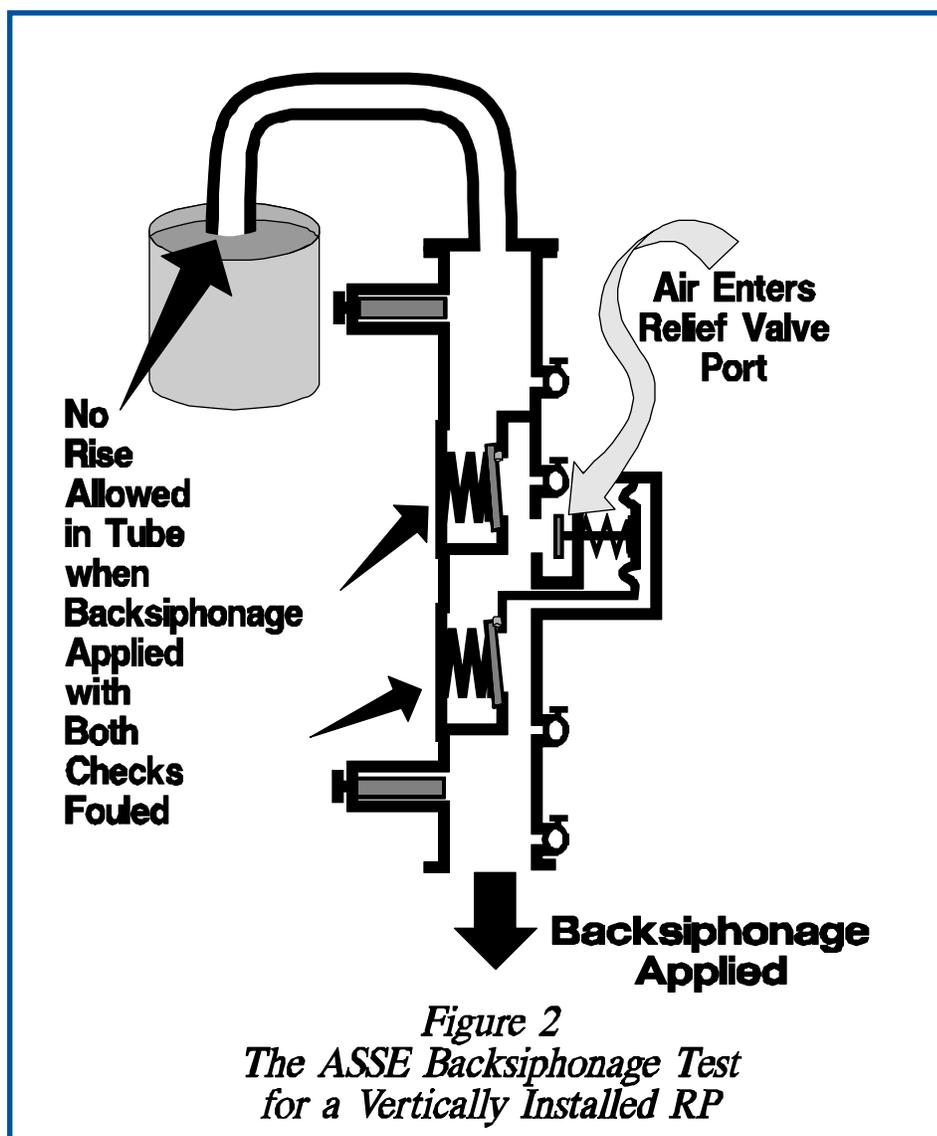
The Specifications in the Ninth Edition of the *Manual of Cross-Connection Control* require both check valves to be fouled simultaneously while the assembly is subjected to both backpressure and backsiphonage. Please see Figure 1 on page six.

The ASSE version of the backsiphonage test is quite different than the method found in the *Manual of Cross-Connection Control*. The ASSE method consists of two parts. In the first part of the test the assembly is set up as shown in Figure 2. Both of the check valves are fouled and the assembly is subjected to backsiphonage. No rise of water is permitted in the tube which is submerged in the water. This test, in essence, assures that enough air enters through the relief valve to compensate for the vacuum, not allowing the water to be siphoned

***No reduced pressure principle backflow prevention assembly {RP} has successfully completed the Foundation's backsiphonage test while installed vertically***

from downstream, even with the check valves fouled.

In the next part of the test, the assembly is arranged as it is in the Foundation's test with the exception of the check valves being fouled. First only the second check is fouled, then backpressure is applied to the



**Figure 2**  
***The ASSE Backsiphonage Test for a Vertically Installed RP***

assembly, then a vacuum is applied upstream of the assembly. No backflow is permitted to occur. The first check valve remains closed.

Next, the test is repeated with the first check fouled, but with the fouling wire removed from the second check. So both checks are never fouled simultaneously with backpressure and a vacuum applied.

Once one understands the differences in the laboratory tests

for the Foundation and other agencies, it is easier to determine which Approval may be more desirable as a requirement under one's area of jurisdiction. These comparisons along with the Foundation's requirement for a one-year field evaluation show that the Foundation's Approval process is more stringent than those of other agencies. 💧

# Calendar of Events

***This calendar shows some of the activities in which the Foundation is currently planning on participating. For more information contact the Foundation office.***

*21 August 1995 - American Backflow Prevention Association Seminar, Madison, WI*

*23 August 1995 - Northern California Backflow Prevention Association Vendor Fair, Pleasanton, CA*

*10 - 11 September 1995 - American Water Works Association, Distribution Systems Symposium, Nashville, TN*

*20 September 1995 - Inland Counties Water Association Update Seminar, San Bernardino, CA*

*18 - 22 September 1995 - Tester Training Course, Las Vegas, NV*

*22 - 23 September 1995 - Tri-State Seminar, Laughlin, NV*

*25 September 1995 - International Association of Plumbing and Mechanical Officials Conference, Sacramento, CA*

*16 - 20 October 1995 - Tester Training Course, Los Angeles, CA*

*17 - 19 October 1995 - CA/NV Section American Water Works Association Spring Conference, Santa Clara, CA*

*6 - 10 November 1995 - Tester Training Course, Charleston, SC*