Code Pipeline

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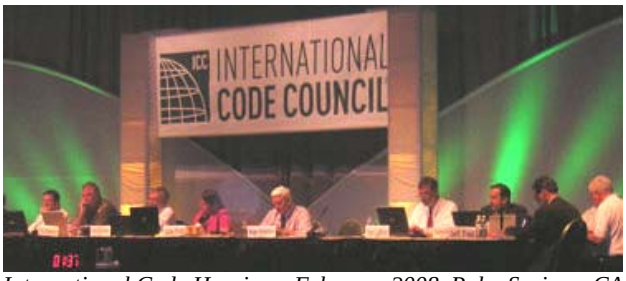

International Code Hearings, February 2008, Palm Springs, CA

Chinese Cast Iron Pipe and Product Standards

By: Ron George, CIPE, CPD, President
Ron George Design & Consulting Services

The State of Michigan turned down a Chinese pipe importer that was applying for state approval for Chinese cast iron pipe. The importer submitted paperwork intended to support the request for state approval of the products. The paperwork was intended to provide evidence of his supplier's compliance with the product standards that are required by the Michigan Plumbing Code. The seller indicated that a third party listing certificate should be sufficient for acceptance of his products for sale in Michigan. Ultimately, the Michigan Plumbing Board did not agree.

Michigan's Product Review
I reviewed copies of the transcripts of the State of Michigan Plumbing Board meeting and the Michigan Construction Code

Continued on page 2

INSIDE THIS ISSUE

Trap Seal Protection Devices Turned Down By the International Plumbing Code

A code change to add elastomeric trap seal devices and eliminating trap primers failed at the International Plumbing Code hearings.

The International Plumbing Code
International Plumbing Code Committee heard proposed code change number P89-07/08 part 1 which was a code change proposal to allow elastomeric valve devices on floor drains to seal sewer gasses and eliminate trap primer valves. The committee voted to disapprove the code change. Committee members made the following comments:

> *"If the standard allows materials or devices that have moving parts in the trap and if it allows a device that creates a flow restriction and is in direct conflict with various sections of the code it should not be accepted because it will create conflicts and weaken the code."*

The attempt to add the elastomeric valves in the drainage system and take the requirements for trap primers out of the code failed.

The proponent said the allowable flow rate for the device came from a manning formula calculation for a sloping drain. The problem with this calculation is it is for the horizontal drain pipe only and every one of these devices is installed in a floor drain connected to a vertical pipe. The reason the horizontal pipe calculation was used with the code change proposal was to establish an allowable minimum flow rate. The reason they had to do this was because in some designs of the device they cause a flow reduction of about 76 percent. This is completely unacceptable to me and apparently the International Plumbing Code Committee agreed also. When equipment drains with large flows such as; tank drains, relief valves, filter backwash cycles, softener backwash cycles or backflow preventer relief valves discharge into a floor drain with one of these devices there is a good chance of these devices will not allow full flow. This will cause flooding which will lead to mold growth, spread of sewage and bacteria throughout the building and other health issues. Other concerns were the possibility of floor wax or grease glueing the device shut or solids in the drain holding the device open. The International Plumbing Code currently prohibits reductions in the direction of flow and also prohibits moving parts in traps to maintain a seal.

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continued from page 1

Commission meeting addressing the requested approval of the seller's Chinese Cast Iron Pipe. I also reviewed copies of the lab reports that were submitted by the seller. It seemed to boil down to an importer trying to gain acceptance of Chinese pipe with inadequate documentation of meeting the manufacturing requirements for cast iron pipe.

The problem is that as an importer, wholesaler or seller of imported Chinese pipe they could have any of over a dozen foundries as their source of cast iron pipe in China and the importer or seller has no control over production or quality of the pipe. The importer or seller of the Chinese pipe attempted to present his company as the maker of the pipe despite the numerous requirements in the standard for on-site testing for quality control that must be done during the manufacturing process. The seller could not perform or witness the tests if they simply buy the material from the lowest bidder. The importer eventually submitted test reports that were from the foundry in China, but that foundry may or may not have been the actual foundry where the importer eventually purchases the pipe. If a seller can purchase product from another foundry at a lower price, then the lowest priced material can get shipped and might not be the material from the foundry submitting the paperwork. It would be inappropriate for a seller or importer to be listed as the foundry because the importer has no control over the overseas cast iron pipe foundry's testing, manufacturing process or quality control.

My Experience

I have had my own experience with the Chinese cast iron material. I have been involved with numerous major projects in Michigan over the last few years as the plumbing designer. On more than one occasion contractors have asked if I would approve Chinese cast iron pipe materials after they had already provided submittals for U.S. made pipe that meets the referenced standards in the code. Not wanting to just say no, and in an effort to be fair, I asked for submittals of the Chinese pipe indicating compliance with the specifications and the standards and received a typewritten page with a note saying the cast iron pipe for the project would be equivalent to the previously submitted pipe. There was no manufacturer documentation, no indication of it meeting a standard, no warranty information and no installation instructions as required in our specification and in the code. I decided to inquire with a few people that I knew in the industry that had experience working with these materials. One of them was a close friend, Dick Bressler, who is a master plumber and is now a Plumbing Inspector in Michigan. He has over 40 years experience in plumbing and heating and he once had his own plumbing & heating company. He said he had a recent experience installing Chinese cast iron pipe and he could tell a distinct difference between U.S. made pipe and Chinese made pipe. He said when he would cut U.S. made pipe from a manufacturer like Tyler or Charlotte it would snap-off clean and the pipe would make a distinctive bell ringing sound when it snapped off. He said when he cut the Chinese pipe it made a crunching sound and the pipe would often crush or break irregularly and leave jagged ends. Based on that information and the fact there was no standard reference, product data, manufacturers installation information, warranty information, or proof of product listings, I decided not to allow the Chinese pipe on my projects.

Suspicion of Falsified Test Reports

The Chinese pipe importer submitted production and quality test reports to the state of Michigan allegedly from one of the many foundries in China that produce cast iron pipe. The production quality test reports were the information that the third party listing agency reviewed to issue their product approval listing. The State of Michigan reviewed the production quality test reports and correspondence as part of their State Product approval process.

I also reviewed the submittals and was surprised to see the production testing logbooks from the Chinese foundry were in English. I would have expected to see the production testing logbooks written in Chinese. (I would be just as surprised if a U.S. manufacturer kept their production testing logbooks in Chinese.) There were numerous things that raised my suspicions concerning these test logbooks. For example, the tension test for metallurgical consistency indicated that the Chinese material always fractured at the exact same fracture or breaking load force on sixteen consecutive tests. It is nearly impossible to fracture or break sixteen different test bars and have the exact same fracture or breaking load on even two occasions. The odds of this happening would be equivalent to winning the lottery 16 days in a row. Still another red flag was that all sixteen test bars in the Chinese test were exactly the same diameter measured to a thousandth of an inch. The testing I have witnessed in the U.S. manufacturing facilities convinced me it was extremely difficult to machine a cast iron test bar on a lathe to the exact same diameter within a thousandth of an inch sixteen consecutive times. Even with a very sophisticated computer controlled lathe there are typically some variations of several thousandths of an inch between samples. Another odd coincidence was that the minimum breaking load recorded on their test report for each test bar diameter was the same number listed in the published charts for the minimally acceptable failure point of the test for each of the sixteen tests. Other aspects of the report raised suspicions as well. The hand writing was all written in English and uniform and neatly written with the same ink and it was in perfect alignment. (which is not likely to happen with multiple entries in a production log over a long period of time) The interesting thing was the person who did the testing apparently never sleeps. The log listed the same persons name conducting the testing around the clock.

Other conflicting information in the submittal was purchase order paperwork from the importer that identified a total of eight thousand seven hundred and sixty four (8,764) pieces of pipe in sizes ranging from two inch through ten inch diameter in 10 foot lengths being produced on November 21, 2006 through November 25, 2006. The Listing agency also had paperwork showing they were on site at that foundry on November 21, 2006 and their inspection report had notes "no production at the time of inspection" and they had notes that "no listed products were in stock at the time of their inspection". This indicates either the listing agency's site visit report or the manufacturer's test reports are in error.

The Michigan Plumbing Board and Chief Plumbing Official did their job and looked at the details to catch the inconsistencies and deny the Chinese materials. Their denial was probably based on concerns about the reports being fabricated after the fact to satisfy the listing requirements for the pipe.

This is an example of a loophole in the product certification system. If product listing agencies are going to simply collect money and issue listings without enforcing the standards that the products are supposed to be listed to, then the system needs to be fixed. The product certification agencies should witness the testing to make sure the products comply.

The system needs to be adjusted to make it fair for U. S. manufacturers who have on-site testing, quality control and pollution control equipment and they actually meet the requirements in the standard. In my opinion, the State of Michigan code officials did their job. In this day in age with all of the other quality problems with products being imported from China, I'm finding it hard to find much sympathy for someone who may be trying to cheat or cut corners to gain acceptance at the expense of quality and loss of jobs in American foundries.

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continued from page 1

CODE CHANGES AT ICC HEARINGS WILL AFFECT: WATER HEATER CONTROLS, MINIMUM WATER PRESSURES, AND GREASE INTERCEPTORS.

By Ron George, CIPE, CPD, President,
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The International Code Council (ICC) held its code hearings in late February in Palm Springs, Calif. The hearings, which took place Feb. 18 through March 1, were conducted in two tracks and covered all of the ICC's family of codes.

Notable changes to the plumbing code include increasing the minimum required water pressures at various plumbing fixtures and code changes addressing grease interceptor requirements.

For more info see
http://www.csemag.com/article/CA6541979.html?industryid=47250

CALENDAR OF EVENTS

- **Kitchen &Bath Industry Show & Conference**
  Chicago, Illinois
  April 10-13, 2008

- **8th World Plumbing Conference**
  Calgary Alberta, Canada
  September 24-27, 2008

- **ISH North America**
  Atlanta, Georgia
  October 1-3, 2008

- **2008 ASPE Convention and EPE Show**
  Long Beach, California
  October 25-29, 2008

- **2008 ASSE Annual Meeting**
  Hyatt Regency, Grand Cypress Resort
  Orlando, Florida
  November 19 - 23, 2008

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International Code Hearings, February, 2008, Palm Springs California.

Safely Testing Your PVC and CPVC Piping System

By. Ron George, CIPE, CPD.

During the recent International Plumbing Code hearings a code change was presented that would allow air testing of PVC pipe. Numerous plumbing industry personnel and piping manufacturer's testified against air testing because if the inherent dangers of air testing. The plumbers on the code committee voted to keep air testing more for convenience over safety. After installing a new PVC or CPVC plastic pipe and fittings system and cement joints have been adequately cured you are ready to test and inspect the system for leaks. If the temperature is below freezing, the proper way to perform the test would be to heat the building or provide an anti-freeze mixture with the test water. The code committee chose to allow air testing up to five pounds per square inch (psi) as an alternate test method.

Air Testing Can Be Dangerous

The most common test method is to use is a hydrostatic test with water pressure at ten feet of head for drainage piping and one and one-half times the system working pressure of 80 psi or 120 psi for water supply piping. Installers sometimes choose to test with air pressure because it is more convenient in the winter months. Air testing, if done improperly, can be extremely dangerous. Most installers don't realize the maximum air pressure test for drainage piping should be only five psi.

Air is a compressible gas that when compressed can store far more energy than water when put under pressure because air can release this stored or compressed energy very rapidly. In cold weather conditions plastic pipe is more brittle and this raises the possibility of an explosion. The most common cause of plastic pipe failure is when contractors use too much air pressure, which can result in an explosion. Other testing mistakes that can cause failures are:

- Applying pressure over 5 psi to the system
- Using a pressure gauge graduated to more than fifteen PSI (the test pressure should be in the middle third of the gauge).
- Failing to vent trapped air. After the test which can cause violent fracturing of china fixtures which can lead to shards of sharp china flying around like shrapnel and water hammer damage to piping and equipment.
- Failure to depressurize the system (safety hazard for others).
- Often a contractor has an old pressure gauge bouncing around in their tool box and it usually is a much higher pressure range than one required for a low pressure air test. In order to get the needle to indicate a pressure on a high pressure gauge, contractors often put much more than 5 psi air pressure in the piping system. This creates a bomb.
- Failure to remove the test plugs with caution. (test plugs can become cannon balls or projectiles that have been known to kill people.)
- Unglued joints or joints that have not properly cured can turn a section of straight pipe or a stubout into a missle.

Recommendations for Water Testing
It is important to know that pipe and fitting manufactures do not recommend air testing and should not be held liable for injuries occurring during the air testing of their product. Most PVC and CPVC piping component manufactures have statements in their literature cautioning against using air or gases to test their products. They also caution against using their product to store or convey air or other gases or failing to vent trapped air. It is increasingly common for such practices to void any warranties. Many accidents have been reported as a result of air testing or tapped air. Most manufactures of plastic pipe fittings have had to investigate field failures caused by either air testing or trapped air.

Water Testing is Safer
Overall, water testing is a safer, more reliable and more accurate method for testing plastic piping systems. Because PVC and CPVC pipe fittings are designed to convey liquids, most companies recommend testing with water. The purpose of the test is to locate any leaks at the joints and correct these prior to putting the system in operation. Because it is important to casually inspect the joints, a water test must be conducted prior to closing in the piping or back filling under ground piping.

If there is a leak in the system, it will always be easier to locate when testing with water; air leaks can be hard to find. Air tests have a built-in inaccuracy that is hard to control. The system pressure changes with temperature; whereas a water pressure test is not as sensitive to temperature variations.
To properly water test, plugs should be inserted through test tees to isolate each section being tested. All other openings should be plugged or capped with test plugs or test caps. Then fill your system with water to the highest point. The hydrostic pressure created as the water fills the vertical pipe increases as the water height climbs. Filling the system slowly should allow any air in the system to escape as the water rises in the vertical pipe. All air trapped in the system must be expelled prior to the beginning of the test. Failure to remove entrapped air may give faulty test results.

If a leak is found, the joint must be cut out and discarded. A new section can be installed using couplings. Once the system has been successfully tested, it should be drained and the next section should be prepared for testing.
When it comes to testing pipe and fitting installations, water testing is a safer, more thorough method that air testing. Taking a few extra minutes to properly test piping systems with water pays off in error-proof installation and a safer job sit. The plumbing industry needs to know about the dangers of air testing to aid them in safely testing PVC and CPVC piping systems.

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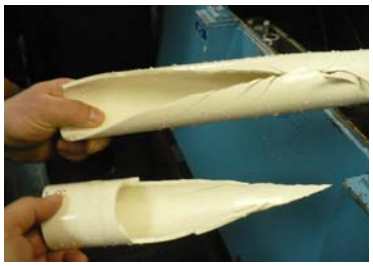

Note the sharp edges on pieces of a PVC pipe that burst under pressure. These pieces become shrapnel when compressed air is in the pipe.

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ADDRESS CORRECTION REQUESTED