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Volume 1, Issue 4

Code Pipeline

The American Society of Sanitary Engineering (ASSE) has Received Approval for the Following Standards

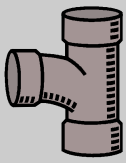
From: www.asse.org

- ASSE #1017-2003:
  Temperature Actuated Mixing Valves for Hot Water Distribution Systems
- ASSE #1027-2008:
  Fill Tank Backflow Protection Systems for Gravity Water Closet Flush Tanks
- ASSE #1043-1991:
  Performance Requirements for Cast Iron Sovent Sanitary Drainage Systems
- ASSE #1050-2002:
  Stack Air Admittance Valves for Sanitary Drainage Systems ◦

The Following NFPA Committees are Looking for New Members:

- Committee on Building Code—Board and Care Facilities:
  This Committee is responsible for chapters in NFPA 5000, Building Construction and Safety Code®.
- Committee on Fire and Emergency Services Protective Clothing and Equipment—Electronic Safety Equipment:
  Seeking members interested in: enforcer, labor, user and consumer. This Committee is responsible for NFPA 1800, Standard on Electronic Safety Equipment for Emergency Services (Proposed); NFPA 1801, Standard on Thermal Imagers for the Fire Services (Proposed); and NFPA 1982, Standard on Personal Alert Saftey Systems (PASS). ◦

Inside This Issue:



New Chlorine Test Requirements for Cross Linked Polyethylene (PEX) Tubing

From: *www.nsf.org*

CSA B137.5 standard now requires oxidative stability on PEX tubing designated for potable water applications. NSF/ANSI Standard 14 has recently been updated with Addendum 1.0. The addendum concerns a revision to Section 5.7 for chlorine resistance – dependent transfer listing requirements.

CSA B137.5 now includes chlorine resistance testing requirements. These requirements, identified in Section 5.10, specify tubing as having a minimum time-to-failure of 50 years. The test method, as identified in Section 6.11.1, shall be against ASTM F2023.

Addendum 1.0 is now part of NSF/ANSI Standard 14. Addendum 1.0 includes a revision to Section 5.7 for Chlorine resistance – Dependent Transfer Listing requirements. The additions, shown below, clarify the conditions and criteria of products required to meet chlorine resistance.

5.7 Chlorine resistance – Dependent Transfer listing requirements
In order to qualify a pipe made from a material that already has a chlorine resistance classification – Dependent Transfer Listing, the following minimum requirements shall be met:

- Three (3) data points at the highest stress and highest temperature conditions shall be used as for the original data set;
- Two (2) data points at the second highest stress and the highest temperature conditions shall be used as for the original data set;
- The 95% lower prediction limit (LPL) shall also be calculated for the original material data at these temperature/stress conditions;
- The 95% upper prediction limit (UPL) shall be calculated for the original material data at these temperature/stress conditions;
- All five (5) data points (failure times) shall meet or exceed the LPL for that condition;
- All five (5) data points (failure times) shall meet or not exceed the UPL for that condition;
- The five (5) data points shall be added to the original data set, and all parameters in section 13 of the ASTM F 2023 test method shall be recalculated. The new values shall comply with the requirements of ASTM F 876.

Manufacturers that are currently certified to CSA 137.5 standard have until July 2009, to comply with the new requirement. The new requirement for NSF Standard 14 – the Dependent Listing Transfer Test – will be implemented immediately for new clients and in January 2009 for the listed manufacturers with an established three-year monitoring test frequency. Please contact your project manager at NSF for additional information on these requirements. ◦

Lead Update

From: *www.nsf.org*

On January 1, 2010, the California bill AB 1953 from the 2006 legislative session, that became law will go into effect. This law limits the weighted average lead content of products to not more than 0.25% for pipes and pipe fittings, plumbing fittings, and fixtures sold in California intended to dispense water for human consumption.

Last fall, a proposal was submitted to the NSF Drinking Water Additives Joint Committee that NSF/ANSI Standard 61 be amended to allow manufacturers the option of being certified to the requirements of AB 1953. The proposal was referred to the Lead Task Group resulting in the development of Annex G including the evaluation methodology and calculation for compliance. Currently, Annex G is undergoing the approval process and can be found on NSF's new standard workspace. Through the work of the Lead Task Group, the creation of a standardized method of evaluation has been introduced to the California Building Standards Commission and the Department of Toxic Substances Control to facilitate recognition of the standard and the need for harmonization of evaluation methodologies.

What you need to know
A full understanding of the requirements of AB 1953 will be possible once a regulatory mechanism is in place.
Coatings and lead surface treatments are not taken into account when calculating the average weight lead content in the current version of Annex G. Inclusion of these technologies will likely require a substantial effort to develop methods that evaluate their durability and long-term effects.

A separate California bill, **SB 1395**, proposes that lead plumbing monitoring and compliance testing be performed by the California Department of Toxic Substance Control as part of the department's ongoing program to reduce toxic substances from the environment. The department would annually select no more than 75 drinking water faucets or other drinking water plumbing fittings and fixtures for testing and evaluation.

Another proposed California bill, **SB 1334**, requires that the products be certified for compliance with these provisions by an independent third-party certifier, such as NSF International. In addition, the bill requires that certification include testing of materials in accordance with the protocols used by the California Department of Toxic Substances Control (DTSC).

A proposed Vermont Bill, **S152**, will require that all plumbing products comply with the 0.25% lead requirement, similar to California. This bill passed both the Vermont House and Senate and is currently waiting the governor's signature.

There is less than two years before the mandatory compliance goes into effect. This leaves little time for manufacturers to redesign their product line. NSF is committed to assisting clients and determining if their products meet the requirements for of these new laws. ◦

Uniform Plumbing Code Technical Committee Meeting Update

From: *www.nsf.org*

The Uniform Plumbing Code Technical Committee met on May 5th-6th to discuss the public comments for the 2009 Uniform Plumbing Code (UPC). This is the first step in the three-year code cycle process.

The committee discussed and "straw" voted on whether to accept or reject public comments submitted on the committee's previous actions. The actual voting is done by letter ballot so the official outcome may differ from what happened during the meeting.

The Final Report on Proposals will be available by **August 15, 2008**. The IAPMO membership will provide input at the annual convention **September 28-October 3, 2008** in Atlanta, Georgia. Below is an update on the issues affecting the plumbing industry:

- **NSF/ANSI 14** – The committee upheld their decision to require plastic pipe and fittings to meet NSF 14: *Plastic Piping System Components and Related Materials*.
- **NSF/ANSI 61** – The committee previously voted to require valves used to supply drinking water to meet the requirements of NSF/ANSI Standard 61: *Drinking Water System Components-Health Effects*. This went unchallenged in the public comment period.
- **Cast Iron** – Marking for soil pipe and fittings will be required to include country of origin and identify the original manufacturer.
- **Polypropylene** – The committee continued to support adding polypropylene pipe and fittings for use as hot and cold water distribution and building supply.
- **Polypropylene/Aluminum/Polypropylene** – These types of pipe and fittings continued to be rejected by the committee due to the lack of a consensus standard covering these products.
- **Waterless Urinals** – Waterless urinals could potentially be added to the UPC with the condition that the water distribution piping is roughed in to allow for retrofits.
- **Air Admittance Valves (AAVs)** – The committee upheld the decision to accept air admittance valves in an Appendix L for engineered systems. Where AAVs are accepted as engineered systems, the code will provide guidance for their use.
- **CSA B125.3** – CSA B125.3 *Plumbing Fittings* was added to several sections of the code as an alternative to ASSE 1070 in line water temperature limiting devices.
- **Velocity** – The committee reversed an earlier decision to allow plastic piping with brass fittings an exception from velocity limitations imposed for copper alloy fittings. If the ballot follows the straw vote, plastic piping will not be given an exception and will continue to be limited to 8 feet per second for cold water and 5 feet per second for hot water.
- **Trap Sizing** – The minimum trap arm size for a single head shower was reduced from 2" to 1 ½".
- **Showerhead Water Discharge** – The committee voted by a narrow margin to require the limitation of flow of 2.5 gallons per minute even when multiple showerheads are operating.
- **Primers** – Clear primers detectible by UV or black lighting was not accepted because the current standard for primers does not reference this technology.

If you have questions on the Uniform Plumbing Code development process, this page: http://www.iapmo.org/Pages/Code%20Development%20Process.aspx, outlines the process and has the latest information to help you stay informed.

If you have any specific questions regarding NSF or products meeting the Uniform Plumbing Code, contact Jeremy Brown, NSF Codes & Regulatory Manager at brown@nsf.org. ◦

Ultra Violet Light Testing to be Required for PEX Tubing

From: *www.nsf.org*

The ASTM task group for F876: *Standard Specification for Crosslinked Polyethylene (PEX) Tubing* has been busy updating the standard. Of key interest, is the addition of the UV resistance testing, which will become an option for manufacturers whose products could potentially be exposed to sunlight.

While PEX tubing is not typically used in outdoor applications, tubing may become exposed to sunlight during storage. The testing involves exposing products to sunlight for a specified time period, as outlined in ASTM F2657, *Standard Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing*, then evaluating the oxidative resistance of the product per proposed requirements in ASTM F876, *Standard Specification for Crosslinked Polyethylene (PEX) Tubing*, and according to the ASTM test method F2023 for evaluating the oxidative resistance of PEX tubing and systems to hot chlorinated water. Tubing certified for non-potable water use only, may choose to have stabilizer functionality test done instead of the chlorine resistance testing.

Once the product has gone through the applicable exposure period and has passed the UV resistance testing, the pipe material designation code will be updated to indicate that the material has met the requirements for UV resistance. The code will indicate the amount of exposure time that was used for the evaluation of the sample.

Numerous manufacturers have expressed interest, and have started the exposure for UV resistance. Due to the length of time required for the exposure and chlorine resistance testing, manufacturers interested in pursuing this option are encouraged to contact their project managers for more information on starting the testing process. ◦

Model Codes Update

By: Ron George, CIPE, CPD
From: *Plumbing Engineer Magazine*

The two model code organizations are busy finalizing their 2009 editions of their respective codes. Their upcoming meetings are full of educational sessions with an emphasis on green buildings and various other education seminars.

International Code Council
The International Code Council (ICC), is a membership association dedicated to building safety and fire prevention, and they develop the building safety and fire prevention codes used for the construction of residential and commercial buildings, including homes and schools. International Code Council members include: state, county and municipal code enforcement and fire officials, architects, engineers, builders, contractors, elected officials, manufacturers and others in the construction industry. The ICC organization has nearly three hundred chapters, each with its own personality and focus, representing all ICC member professional disciplines.

The International Codes, or I-Codes, published by the International Code Council, provide minimum safeguards for people at home, in institutions, at school and in the workplace. The International Codes are a complete set of comprehensive, coordinated building, safety and fire prevention codes. Building codes provide for public safety in the built environment.

International Model Building Codes:
The purpose of a set of model building codes is to establish minimum requirements necessary to protect public health, safety and welfare in the built environment. Model building codes provide for protection from fire, structural collapse, electrical, mechanical and plumbing hazards and general building deterioration. Safe buildings are achieved through code-based design and construction practices in concert with a code administration program that ensures compliance. The inspectors have a very important role in making sure the built environment is safe. Model codes serve to keep construction costs down by establishing uniformity in the construction industry. This uniformity permits building and materials manufacturers to do business on a larger scale—statewide, regionally, nationally or internationally without having to worry about uneven enforcement from weak or vague code language that leaves interpretation up to the code official. A good code will spell out all of the code requirements in the body of the code so enforcement if fair and consistent in all jurisdictions. This larger scale approach, in turn, creates cost savings for the end consumer. Codes also help protect real estate investments, commercial and personal, by providing a minimum level of construction quality and safety.

International Code Council Code Development Process:
The International Code Council uses the governmental consensus process to develop its building safety and fire prevention codes. It is an open, inclusive process that allows input from all individuals and groups. Committees hear all code change proposals. An appeals process allows anyone to appeal an action or inaction of a code committee. Final decisions are made by International Code Council voting members - code enforcement and fire officials who, with no vested interests beyond public safety, represent the public's best interest. ICC also offers technical and educational support regarding the codes as well as certification exams to test professional knowledge of code enforcement and construction.

How a Code Becomes Law:
Legislative bodies are not obligated to adopt model building safety or fire prevention codes, and may write their own code or portions of a code. A model code has no legal standing until it is adopted as law by a legislative body (state legislature, county board, city council, etc.). When adopted as law, owners of property within the boundaries of the adopting jurisdiction are required by law to comply with the referenced codes. Because codes are updated, existing structures usually are required to meet the code that was enforced when the property was built. The primary application of a building code is to regulate new construction. Building codes usually only apply to an existing building if the building undergoes reconstruction, rehabilitation or alteration, or if the occupancy of the existing building changes as defined by the locally adopted building code.

Support Builds for Community Building Code Administration Grant
Congressman Barney Frank (D-Mass.), Chairman of the House Financial Services Committee, along with Representatives John Boozman (R-Ark.), Michael Capuano (D-Mass.), Betty McCollum (D-Minn.), Robert Scott (D-Va.) and Pete Stark (D-Calif.) are the latest co-sponsors of the "Community Building Code Administration Grant" Act of 2007 (CBCAG). If approved, Community Building Code Administration Grant funds would be dedicated to training inspectors that are being called "First Preventers," They are like the Medical First Responders in the Fire Service except they are responding to the need for building inspectors in the wake of a building boom following a disaster when many communities resources are stretched thin or non-existent. These are building, plumbing, mechanical, electrical and fire safety officials who prevent harm by ensuring compliance with safety codes before a disaster occurs. The bill would make it possible to recruit and train inspectors in under-served communities or communities in greatest need of inspectors or code officials to assure safety through code compliance.

In many communities, there simply are not enough resources for building safety inspection and plan review officials. A community can adopt codes, but if they do not have trained people to ensure compliance and provide support, there is no enforcement of the codes.

The Community Building Code Administration Grant authorizes a competitive grant through the Department of Housing and Urban Development to help local governments hire, train and equip code officials to save lives and protect property. Introduced last December by Sen. Mary Landrieu (D-La.) and Rep. Dennis Moore (D-Kan.), the CBCAG would aid communities that see their resources over-stretched – or lack resources

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altogether in the face of building booms or major rebuilds after a disaster.

"I firmly believe that this legislation will help ensure the safety of buildings across the country and ultimately will reduce the cost to the American taxpayer after a disaster," said Congressman Moore. "Responsible building codes are a wise investment and the right thing to do for our communities, which is why I appreciate the Chairman's support of this important initiative and look forward to working with him in the future to try to advance this legislation through the House."

"It's been proven over and over again that houses built to code and inspected properly stand up to natural disasters," said International Code Council President Steve Shapiro, Mr. Shapiro is Director of Codes Compliance for Hampton, Va. "Studies show that for every federal tax dollar spent on mitigation costs through grants, it saves the community four dollars in recovery and rebuilding costs."

As of this writing, the Community Building Code Administration Grant currently awaits action by the House Financial Services Subcommittee on Housing and Community Opportunity and the Senate Committee on Banking, Housing and Urban Affairs.

International Code Council Annual Conference Will Feature: Code Development, Disaster Response and Green Buildings.

Residential fire sprinklers and improved energy efficiency are just a few of the code change proposals expected to draw lively debate during the International Code Council's Final Action Hearings at the Code Council's 2008 Annual Conference.

The Annual Conference and Final Action Hearing will be held Sept. 14-23, at the Minneapolis Convention Center in Minneapolis, Minnesota. The Code Council's Annual Conference offers everyone the opportunity to broaden their code knowledge and contribute to the future of building safety and fire prevention.

"Participation in the code development process leads to safer construction, saved lives and reduced property losses," said Code Council CEO Rick Weiland. "We look forward to welcoming a strong turn-out of "First Preventers" – code officials – along with local government officials, architects, engineers, contractors and other construction industry professionals."

To register, call 1-888-ICC-SAFE (422-7233), ext. 4229. To participate as an exhibitor or sponsor, call 1-888-ICC-SAFE (422-7233), ext. 5264 or visit the International Code Council website at: http://www.iccsafe.org .

The Code Council's Annual Conference features the *Final Action Hearings*, Sept. 17-23, which will result in the 2009 International Codes, and gives all attendees the opportunity to voice their opinions about proposed code changes by fostering full and open participation in the Code Council's governmental process.

Nearly 30 education sessions will be offered during Annual Conference, giving participants the opportunity to earn CEUs and LUs. Topics include hazard response, disaster mitigation, green building and more. Certification testing will be available Sept. 19-22 for residential and commercial building, electrical, plumbing and mechanical inspectors; fire inspectors and fire plans examiners. You can Pre-register for the exams on the ICC Web site

The International Code Council Expo will feature more than 100 exhibitors displaying construction industry-related products and services designed to improve the built environment. A special section of the Expo is dedicated to plumbing, mechanical and fuel gas products. Exhibitors represent manufacturers, service companies, government agencies and trade associations.

Other features activities include the Code Council's Opening Event, hosted by Target Corporation, the annual business meeting, awards luncheon, golf tournament, fun run and the Fifth Annual Bob Fowler Motorcycle Ride.

ANSI partners with ICC to electronically deliver I-Codes in Spanish

The International Code Council (ICC) has partnered with the American National Standards Institute (ANSI) to distribute the recently released Spanish versions of the 2006 International Codes in electronic format. These codes include the International Building, Fire, Residential, Energy Conservation, Plumbing, Mechanical, Fuel Gas and Property Maintenance Codes. The popularity of the International Codes globally has provided the impetus for the Code Council to pursue development of these codes in multiple languages. In addition to interest outside the U.S., ICC has also experienced an increase in demand for the codes in Spanish from the Spanish-speaking community within the U.S.

IAPMO convened annual Technical Committee Meetings May 5-7, 2008.

The International Association of Plumbing and Mechanical Officials (IAPMO) on May 5-7 in Denver convened its annual Technical Committee Meetings to process public comments toward the development of the *2009 Uniform Plumbing Code (UPC), 2009 Uniform Mechanical Code (UMC), 2009 Uniform Solar Energy Code* and *2009 Uniform Swimming Pool, Spa and Hot Tub Code*. The meeting to act on all comments represents one of the final stages of the three-year ANSI-accredited *Uniform Code* development cycle.

During the meetings, four separate task groups of individuals with select expertise were formed to provide focused guidance on specific areas of the code:

1. The Access Task Group
2. The Fat, Oil and Grease (FOG) Task Group
3. The Gray Water and Reclaimed Water Task Group, and The Horizontal Wet Venting for Bathroom (Groups) Task Group.

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Discussions also highlighted a number of issues regarding sustainable environments, including: green building, energy conservation and water reuse, according to Lynne Simnick, IAPMO director of Code Development.

There were one hundred twenty-one (121) public comments regarding the *Uniform Plumbing Code.* Forty-one (41) of the public comments to the plumbing code were approved as submitted and 13 approved as amended by the Plumbing Technical Committee, representing a 45 percent approval rate.

There were 36 public comments regarding the *Uniform Mechanical Code.* Twenty-five (25) of the public comments to the mechanical code were accepted as submitted and two more were accepted as amended by the Mechanical Technical Committee, which amounted to a seventy-five (75) percent approval rate.

There were 15 public comments regarding the *Uniform Solar Energy Code*, with 13 gaining approval as submitted and one more approved as amended, 93 percent approval. There were fifty-eight (58) public comments regarding the *Uniform Swimming Pool, Spa and Hot Tub Code*, 49 were approved as submitted and five others were accepted as amended, which amounted to a ninety-three (93) percent approval. Each of these latter two codes is participating in the ANSI process for the first time.

"The voluntary consensus system (ANSI process) operates on the principle that all who will be affected by the outcome should be freely afforded a voice in creating IAPMO's standards for the *2009 Uniform Codes*,"

Simnick said. "Bearing this in mind, these meetings were extremely successful as each public comment at the hearings was discussed and acted upon."

The Technical Committee Reports, consisting of the Report on Comments and the preceding Report on Proposals, will be presented at the Association Technical Meeting Convention, Sept. 28 through Oct. 3, at the IAPMO Annual Education and Business Conference in Atlanta, Georgia. The *2009 Uniform Codes* should be published next spring.

AIA Approves IAPMO as CEU Provider

The International Association of Plumbing and Mechanical Officials (IAPMO) has been approved as a Registered Provider for the American Institute of Architects (AIA), the leading national association for licensed architects. As a result, architects and related professionals can now satisfy their continuing education AIA renewal requirements through participation in IAPMO courses and seminars. "The AIA is dedicated to providing quality continuing education to its members and has recognized IAPMO as an organization that meets their high quality standard," said Kathleen Mihelich, IAPMO director of Career Services. "This makes IAPMO an alternative for architects nationwide who desire to learn more about the plumbing and mechanical codes. Architects are no longer limited to continuing education concerning only the building code."

The approval was granted based on a comprehensive AIA review of IAPMO's educational content development and instructional design process; needs assessment protocol; quality assurance and improvement measures; and program and information management procedures. The AIA concluded IAPMO satisfied each requirement on behalf of its membership. It's another step in fulfilling IAPMO's goal to provide educational and training services - accredited by bodies both international and national on down to the state and jurisdiction level - to a broad group of professionals for whom continuing education is vital.

Sponsorship growing for International Association of Plumbing & Mechanical Officials and World Plumbing Council's International Emerging Technology Symposium in Chicago, IL

The International Association of Plumbing and Mechanical Officials (IAPMO) will co-convene with the World Plumbing Council (WPC) an International Emerging Technology Symposium, Aug. 19-20 at the O'Hare Marriott in Chicago. Sponsorship and support for the event is growing. Just a few of the organizations sponsoring the International Emerging Technology Symposium include: Sloan Valve Company, the American Society of Sanitary Engineering (ASSE) and The Institute of Plumbing Australia Inc. (IPA). "This symposium represents an exciting opportunity to highlight how our industry creates and adapts to emerging technologies," said IAPMO Executive Director GP Russ Chaney. "The event promises to be tremendously informative, as we trust a great many unique organizations will seize the opportunity by providing their most highly-qualified experts as presenters and panelists."

"We have kept the cost of registration low at $295 for both days (includes breakfast, lunch and afternoon snack) in order to encourage international participation," according to Maria Sol Alba, IAPMO Training Client Services supervisor. "Hotel reservations should be made directly with the Marriott by mentioning the IAPMO event, with a special room rate of $129 per night."

The timely event will allow participants to learn how the manufacturing, engineering and trade industries devise solutions to international regulatory developments.

For sponsorship opportunities and/or information on participating in the event, please contact Maria Sol Alba at (708) 995-3005 or Career.Services@iapmo.org.

IAPMO Begins Work on Green Supplement

Following through on their commitment to be the leader in sustainable model code provisions through the promotion of safe and reliable, environmentally responsible construction practices, the International Association of Plumbing and Mechanical Officials (IAPMO) on April 9 in Chicago convened the inaugural meeting of its Green Technical Committee. This initial dialogue formally launches IAPMO's efforts to identify opportunities to make the *Uniform Codes* more embracing of sustainable practices and technologies and develop the first

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ever green supplement for plumbing and mechanical codes.

Assembled from a host of top experts in water efficiency and the sustainable plumbing and mechanical industries, the Green Technical Committee seeks to develop and maintain a supplemental document establishing requirements for green plumbing and mechanical systems, while ensuring these practices are safe and reliable. The green plumbing and mechanical supplement will also serve as a repository for provisions that can ultimately be integrated into the *Uniform Codes* and supplement codes developed by other organizations.

"I consider it a great honor to be part of this pioneering effort to develop a whole new set of provisions that promote and ensure sustainability in our future building practices," said committee Chairman Bill Erickson of CJ Erickson Plumbing Co. "I have placed a very high priority in my work to see this to its fruition." The supplement will seek to meet these requirements through the use of high-efficiency fixtures, appliances and equipment, water reuse and conservation, and renewable energy sources; reexamination of sizing methods and design practices; placing more emphasis on maintenance; and many other tenets of the green movement.

"By creating a comprehensive green plumbing and mechanical supplement, many proactive jurisdictions will have the option of adopting the requirements or using them as a resource to complement their existing plumbing and mechanical codes," said Dave Viola, IAPMO director of Special Services. "Many municipalities across the country have been asking for such a document."

At the meeting, clearly defined goals were established and task groups were formed to tackle specific issues in the development of the code supplement.

The committee's next meeting is tentatively scheduled for Aug. 21, 2008 in Chicago, IL. Contact IAPMO at: 1-(909) 472-4100 for more information. ◦

Pictured: The Stansted International Airport, United Kingdom
This airport uses the siphonic drainage rooftop.

Efficiency in Plumbing: The Basics of Siphonic Drainage

By: Ben Eichler
From: *www.pmengineer.com*

In this day and age, efficiency plays a major role in our society. From finding a car with the best fuel mileage to using the brightest bulb that operates on the least power, people are able to save time and money by using a more efficient solution. So why should solving our plumbing problems be any different? While siphonic drainage is hardly a new technology to parts of the world, it is relatively new to the U.S. market and is one of the most efficient drainage solutions available.

Siphonic drainage operates with the piping system completely full of water, whereas a conventional piping system contains roughly 1/3 to 2/3 of water. The remainder of the piping is filled with air under atmospheric pressure. By increasing the pipe capacity, and in turn, efficiency, the pipe diameters can be reduced.

How It Works
Siphonic drainage is made possible by the addition of an engineered baffle placed in the sump of a standard roof drain. The purpose of this baffle is to prevent any air from entering the pipe by forcing the water straight down instead of allowing it to vortex around the sump/outlet.

Once the water is forced downward into the tailpiece of the drain, the absence of air and atmospheric pressure creates a negative pressure in the pipe and the siphonic effect begins. The water then moves into a horizontal collector pipe where it flows towards the downspout, with the pressure constantly decreasing. Before the negative pressure reaches a level that could possibly damage the pipe, the pipe size is increased to alleviate the pressure. Eventually, the water hits a vertical downpipe to carry it to the sewer system.

As the flow moves down this pipe, the pressure starts to increase again and approach zero. Before the pressure reaches zero, the pipe size must be increased and the siphonic action is broken at this point. This allows the water to enter the sewer at the same rate as a conventional system would, and by increasing the pipe diameter, the flow velocities drop to an acceptable level that will not damage the sewer system.

Most manufacturers sell a drain with a tailpiece already attached to the drain; this tailpiece is customized to the drain and cannot be shortened or the drain may not prime correctly.

The driving force behind a siphonic system is referred to as the disposable head, which is the difference in height between the fluid level on the roof and the discharge point. This is the potential energy available to the system and helps create the siphonic action after the system is primed. In conventional drainage, the only potential energy available is the amount of water built up on the roof. The increased energy in the siphonic system assists in the higher flow velocities and increased discharge value of the system.

It is important to understand that a siphonic roof drain system will not always be operating with siphonic action during a rainfall. As rain starts to fall on a rooftop and enter the drains, the siphonic

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drains will initially act in a conventional manner. Air will continue to enter the piping until rainfall increases and allows water to build up in the sump of the drain.

As water builds up on the roof, the piping system is slowly purged of any air entering the system. The number of air pockets in the system will decrease until the piping is completely full of water. If the current rainfall intensity is less than the designed roof capacity, the water will quickly drain off the roof and the cycle will start over again.

Design Considerations

Siphonic drainage systems can be designed for any type of roof or building, but it may not always make much economical sense to utilize them. Because it is necessary for a fair amount of negative pressure to build up in the horizontal piping, siphonic designs for taller buildings become complicated. If the building is tall but not that wide, the required pressure build up makes it difficult to design a siphonic system. It is for this reason that siphonic drainage systems are more commonly designed for use on low-rise buildings with a large roof area such as warehouses, airports and schools.

When designing a siphonic piping system, it is helpful to have siphonic design software to assist in the calculations. The key to designing an efficient siphonic system is to create a system where the residual head pressure is as close to zero as possible. The residual head pressure is the difference in the disposable head pressure and the energy losses in the system.

Examples of energy losses include friction in the pipe, fittings, and the drain body itself. Values for these frictional losses are factored into the calculations of the software and can also be obtained from the fitting manufacturer if hand calculations are attempted by the engineer.

The hydraulic calculations can become quite cumbersome when done by hand so the software is really a time-saving tool. Necessary inputs for most software programs include: roof area, roof dimensions, rainfall rate and pipe lengths. The software program will then calculate the required pipe diameters and will detail exactly what is going on in each pipe section. Pressures, flow velocities (ft/s), and the flow rates (gpm) within the drainage pipes are monitored to check the effectiveness of the design.

Most of the software packages available also include built-in checks to ensure that the design will run correctly. Pressure in each pipe section is monitored to prevent damage to the piping system. Maximum velocity and drainage capacity are monitored at the discharge point to let the user know how much water will be entering the sewer and at what rate. Minimum flow velocities are also checked throughout the system to verify that the system will remain self-cleaning.

After the system is designed, the software should output a comprehensive data chart, as well as a graphical layout of the system, for use by the engineer or installer. This layout usually consists of a 2D line drawing that details the pipe lengths, diameters and orientations. When installing the system, the layout provided by the software must be rigidly followed. Any last minute changes to the piping layout, no matter how small they are, must be recalculated in the software to guarantee that the system stays in balance.

Installation And Maintenance

A siphonic system is considered an engineered system by the plumbing codes. As such, certain precautions need to be taken when installing it. ASPE Design Standard 45 has a nice basic layout for installation procedures, as well as material and connection standards for the piping. Some important installation tips:

- All reducers should be of the eccentric type, with the crown of the pipe installed level.
- All branches should be created using a 45-degree lateral wye.
- All 90-degree bends should be created using (2) standard 1/8 (2 x 45 degree) bends.
- All horizontal pipes should run flat with zero slope.

Like any roof drainage system, regular maintenance of the rooftop is required to ensure optimal performance of the system. Large debris caught on the outside of the dome or gravel guard of the drain will need to be removed periodically to allow water to enter the drain body directly. Small debris will be flushed through the system when siphonic action occurs.

Advantages Of Siphonic Drainage

Besides allowing for the most efficient use of the piping material, a siphonic drainage system offers other advantages to the engineer and/or contractor:

- The reduced diameter of horizontal and vertical pipes will lower building costs.
- Horizontal piping is installed without pitch, saving ceiling space for increased storage or building capacity.
- There is an ability to tie more drains together in one horizontal run and reduce the number of downspouts.
- The downspout locations are flexible and can be placed conveniently around or within the building.
- Because the downspout placement is flexible, they can be placed in a location that will require the installer to do less costly site excavation.
- A siphonic system is considered a self-cleaning system due to the higher flow velocities in the piping. Any debris that enters the piping will be quickly flushed through the system or knocked loose by the fast-paced water. This eliminates the need for cleanouts in the siphonic portion of the system.
- LEED points can be awarded for a siphonic drainage installation.

What The Future Holds

Like any new product entering the market, no one wants to be among the first to try out the system when old, tried and true methods have served them well for years. But in today's competitive market, every advantage should be utilized to save money throughout the process.

Siphonic systems have been used effectively throughout Europe for the last 30+ years and many advances have been made in the way they are designed and installed. These European companies have now ventured with U.S. manufacturers to share their knowledge and designs on the subject.

For additional information on siphonic drainage, consult ASPE Design Standard 45: Siphonic Roof Drainage. ◦

Developing Uniform Codes with IAPMO

By: Ron George, CIPE, CPD
From: *Plumbing Engineer*

"Plumbing is Everyone's Business." Coming from anybody else, these words would be little more than a catch phrase, but when delivered with earnest sincerity, as they are by Russ Chaney of the International Association of Plumbing and Mechanical Officials (IAPMO), they carry a lot of weight.

A plumbing manufacturer once produced a poster that I still see hanging in plumbing shops and supply houses. The poster states, "The Plumber Protects the Health of the Nation." These words still ring true for civilized nations. Only about one third of the world's population enjoys sanitary plumbing facilities that are designed and installed with adequate water and sewer for a safe and sanitary facility.

Third-world countries still draw their water from lakes or streams where open-ditch sewers discharge raw sewage to streams, rivers and lakes and spread diseases. Hundreds of thousands of people die each year from very preventable diseases because of lack of treatment facilities for water and sewers. I once toured the Detroit water treatment plant, and a lab technician pointed out that something as simple as a few capfuls of liquid chlorine bleach would kill bacteria in drinking water in third-world countries and prevent diseases that lead to large numbers of deaths each year.

In a very tangible manner, IAPMO's business - making our plumbing systems safe - is now my business too. For the next three calendar years, I will participate in the code development process as a member of IAPMO's Standards Council, which is responsible for administrative oversight of the Uniform Plumbing Code (UPC) and the Uniform Mechanical Code (UMC) development processes. The Standards Council represents the first level of appeal with regard to procedural or substantive issues and chooses the members who will serve on the Plumbing and Mechanical Code Technical Committees. At the conclusion of each three-year development cycle, the Standards council issues the next editions of the UPC and the UMC.

It was an honor to be selected for this prestigious committee, and I am looking forward to the challenges of this very important work. I have been learning more and more each day about the process, and my part is only a small contribution to what is ultimately the collaborative effort of thousands of people involved in the process. The people involved in this process are the proactive people who are making our plumbing systems the safest plumbing systems in the world.

The Uniform Plumbing Code was born 82 years ago (1926) when 39 plumbing inspectors banded together with an ambitious goal in mind. They were beginning to understand the concepts of clean and safe potable water supplies and adequate sewage disposal facilities. They wanted to develop a code that would protect the health of the nation. Their stated goals were:

- to advance the latest and most improved methods of sanitation
- to promote the welfare and harmony between the owner, the builder and the craftsman
- to accomplish a uniformity in the application of the provisions of the ordinances
- to promulgate the mutual benefit of the members

There was strength in their numbers and their goals, but those original inspectors also had a wealth of knowledge. The same type of expertise exists today: Many IAPMO code officials have worked in the trade, or they are experts in their respective fields. IAPMO has representation from each industry group, including manufacturers, users, installers/maintainers, labor, research/standards/test laboratories, enforcing authorities, consumers and special experts on the plumbing and mechanical technical committees. Their differing perspectives contribute to a positive consensus process.

IAPMO gathers a large assembly of plumbing and mechanical experts at its annual education and business conference, where anyone, including members and non-members alike, can have a voice in proposed changes to the code.

This tried and true code development process ensures the continued development and maintenance of the Uniform Plumbing and Mechanical Codes with the following goals at the forefront:

- Effectiveness in protecting public health, safety, and welfare
- The timely evaluation and recognition of technological developments pertaining to construction regulations
- American National Standard Institute (ANSI) consensus code development process, which provides for the open discussion of proposals by all parties who wish to participate.

IAPMO takes great pride in following its ANSI-approved code development process and urges its members and interested parties to get involved, since we all have a stake in the resulting decisions. Since plumbing is everyone's business, they truly mean that any interested parties can submit code changes or comment on code change proposals. It is important for manufacturers, installers, plumbing and mechanical officials, the construction industry, engineers and design professionals to review the proposed code changes and to speak up when they see that a submitted code change might limit competition or create an unsafe condition. The code hearings allow proponents and opponents to voice their concerns to the technical committee. We all benefit from a cooperative effort in developing the codes.

Here is a bit of what goes on before the Standards Council even gets involved in the process.
The Uniform Plumbing Code and the Uniform Mechanical Code are developed under a three-year cycle. The first major step in the process is the Call for Proposals. During this period, anyone may submit a proposed code change to the current edition of either of the codes. The code change forms are available online, and I encourage anyone who wishes to improve a code to fill out a form and submit it for consideration at the next code change cycle hearings.

During their spring meeting, held in the second year of the cycle, the Plumbing Technical Committee and the Mechanical Technical Committee review all proposed changes to the codes. Soon after their meeting, the committees are balloted on whether to accept, amend or reject the proposed code changes. Such actions are

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printed and made available to the public in printed form the following August in the Report on Proposals (ROP).

Following the publication of the ROP, the assembly consideration session takes place at IAPMO's annual Education and Business Conference near the end of year two of the code development process. At this session, anyone in the assembly may speak for or against an action taken by the committee as published in the ROP and may move that the assembly consider a different action on a particular proposed code change. If a motion is successful, it is sent to the technical committee as an assembly comment for its consideration and action at its next scheduled meeting.

These assembly comments are submitted to the technical committees, along with all other membership and public comments received during the Call for Comments period.

At their spring meeting in year three of the cycle, the technical committees review and act on all comments. Again, IAPMO members and others are invited to participate in this open meeting. The committee's actions are published in the Report on Comments. Then, at the annual Education and Business Conference held that year, IAPMO holds the Association Technical Meeting Convention where IAPMO members have a final opportunity to voice their opinions on the language that will be published in the next editions of the UPC and UMC.

Following the association meeting, IAPMO members and other interested parties have the opportunity to appeal to the Standards Council with regard to procedural or substantive matters.

The IAPMO Standards Council consists of nine voting members representing eight interest groups: manufacturer, users, installer/maintainer, labor, research/standards/test laboratory, enforcing authority, consumer and special expert (Due to my expertise in the scope of the UPC and UMC, I was classified as a special expert). No more than three members may represent one interest group, ensuring balance. Standards Council members are Dick Wagner, Bob Courtnier, Dave Levanger, Jim Crawford, John Garvelink, Kevin Kotter, Phil Ribbs, Terry Swisher and Ron George. Staff members are Niel Bogdatz, Gaby Davis, and Lynn Simnick.

I've been attending and involved in IAPMO's code development process for many years, often addressing the committees at their spring meetings. For the next three years, I will probably still offer public testimony during the code change hearings, but I will have a new role as a member of the Standards Council, and I'm excited about serving in this new position.

I have also been serving on the Uniform Plumbing Code Answers and Analysis Committee for several months now. This committee includes a group of industry experts with hundreds of years of experience between them. The committee reviews code questions that have been submitted to IAPMO, and they provide official responses to code questions. Answers and Analysis Committee members are John Roth, Steven Nastruz, Ed Schoenfeld, Bob Adler, Bruce Pfeiffer, Anthony Wilcockson, Phil Campbell, Jed Scheuermann, Ron George and an IAPMO staff representative.

Code questions are forwarded to the chairman of the committee, John Roth, from IAPMO. John distributes the code questions to the committee, committee members respond to him, he drafts the official reply and mails it to the person asking the question, and he has the question and answer posted on the IAPMO Website at www.IAPMO.org.

IAPMO and Uniform Codes officials are being proactive and leading the way toward emerging issues and technologies. One example of their proactive approach is their hiring of Pete DeMarco as a staff person with an expertise in green design and water conservation issues. The green movement is driven by Leadership in Energy and Environmental Design (LEED), with water and energy conservation efforts that promise to shift the plumbing and mechanical landscapes. The easiest way for code officials to anticipate where green design or LEED design concepts will go is to have manufacturers and the promoters of these design concepts at the code and standard development table.

The Technical Committees were held May 5 - 9, 2008, in Denver at The Adam's Mark Hotel to review and act on all proposed code change comments for the 2009 UPC and UMC.

As always, the doors were open to anybody interested in the proceedings because, after all, plumbing is everyone's business.

If you have any questions regarding the development of the UPC or UMC, please contact a member of the IAPMO Code Development Department at (909) 472-4100 or at codesdept@iapmo.org. ◦

IAPMO ES Reports Reach 41 Municipalities

From: *IAPMO ES News*

Evaluation reports completed by IAPMO ES on behalf of several clients have facilitated the issue of multiple building permits within 41 separate municipalities, including San Diego County, Riverside County, Orange County, San Diego and Anaheim. No jurisdiction reviewing an IAPMO ES report has found it to be in any way deficient.

The reports have produced immediate sales for IAPMO ES clients, with permits successfully issued in a variety of jurisdictions in the states of California and Nevada. Contractors have reported back to the manufacturers that the IAPMO ES brand lends significant credibility amount Authorities Having Jurisdiction.

The reports were each completed in an expedited fashion, removing delays in the product evaluation process from the manufactures' critical path.

"Ultimately, the bottom line for any of our clients is sales," said Amir Zamanian, director of IAPMO ES. "Armed with our reports, our clients are already selling their products, while our competitors' time line might still have them waiting. We've given them a readily accepted report in less time, and all of these building permits demonstrate the clear advantage."

IAPMO ES places a premium on open lines of communication with each customer and an aggressive and immediate response to any need or concern that arises.

"Our clients' success is the only true measure of our own success," Zamanain said. "Meeting each client's needs on a daily basis is how we know we are doing our jobs."

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IAPMO ES is accredited by the American Nations Standards Institute (ANSI) per the ISO/IEC Guide 65, General Requirements for Bodies Operating Product Certifications Systems. This means that building products, materials and designs evaluated by IAPMO ES are trusted by contractors, inspectors, officials and Authorities Having Jurisdiction. Compliance with section 1703 of the International Building Code (IBC) and immediate approval of products is assured.

For more information on IAPMO ES, go to www.iapmoes.org or contact Amir Zamanian by phone at 909-230-5533 or via e-mail at amir.zamanian@iapmoes.org. ◦

GreenPlumbers USA

By: Steve Smith
From: *www.pmmag.com*

Steve Lehtonen, executive vice president of the PHCC of California, helped kill state legislation on high-efficiency toilets — and then six months later worked with the same legislator to help make essentially the same bill a new law that went into effect at the start of this year.

Why the change of heart? Long story short: a trip to Australia. That's where, in a 2006 trip, Lehtonen learned about the country's GreenPlumbers program.

The training and accreditation program gives plumbers a new opportunity to capitalize on homeowners' growing concerns to save water and cut energy use. The program was developed by the Master Plumbers' and Mechanical Services Associates of Australia. Since its implementation in 2001, the program has "greened" 5,000 plumbers throughout Australia working at 2,300 businesses, and been one contributor to helping the country cut its water use in half from levels in the 1990s.

After that trip Down Under, Lehtonen sealed a 15-year deal to bring the plumbing program to the United States. We caught up with Lehtonen on May 27 in Chicago as part of the group's Metro City Challenge, a seven-city tour that featured two separate green workshops over the course of just four days after the Memorial Day weekend.

"Plumbers had long held their mission to be protecting the health of the country," Lehtonen told the group. "Because of climate change and global warming, our new mission is to protect the resources of the planet by training plumbers to be advocates and educators in environmental protection and conservation."

The day-long workshop we attended started by giving the 30 or so participants a rundown of the program and its goals. The group only got its official start last September and has since held 30 similar workshops and trained more than 600 plumbers. Judging from hits to its fledgling Web site, Lehtonen believes interest is growing on the program. He said the site only went live in January and earned 440 unique visitor hits. But that number of hits has grown to more than 5,100 last April.

The GreenPlumbers program consists of five courses that total 32 hours of training. The goal for this year is train at least 8,000 plumbers, but over the next 10 years Lehtonen hopes to train some 15,000 plumbers in California and 40,000 across the country. The workshop we attended — "Caring For Our Water" — was one of five classes. The other classes are:

- Climate Care
- Solar Hot Water
- Water-Efficient Technology

Inspection Report Service
These classes are free and intended for general information on green plumbing and heating. The GreenPlumbers USA training program relies on grants, contributions and sponsorships to deliver the training free to participants. For example, the meeting we attended also included a presentation by American Standard on its various water-saving products.

A larger part of the program, however, will be a license available for a fee. Lehtonen says the goal of the license program will be to join with other like-minded businesses to advertise, create a national referral center, create new efficiency programs, etc. — in other words, build the GreenPlumbers USA brand.

"Once the GreenPlumbers concept is known among consumers," Lehtonen added, "they will prefer and demand a green plumber."

Lehtonen also believes the program is a great way to address the workforce shortage facing the construction trades. Drawing on his own example of killing water conservation legislation, Lehtonen had to admit that the conservation plumbing industry can be its own enemy at times when it stands dead-set against the type of progress younger people considering careers accept.

However, if GreenPlumbers USA can enhance the image of the plumber as a green steward, he added, it stands to reason that it could bring more people to the plumbing and heating trades.

MCAA Hosts Green Webinars
The Mechanical Contractors Association of America began a Green Building Webinar Series last March. The presentations are free to members; they begin at 1 p.m. Eastern and last less than one hour.

The MCAA will hold three more webinars this year:

- **July 24 – Matt Gregg** of McKinstry Co. will lead a session on "Water Efficiency Products and Design" and cover, among other topics, water-efficient toilets and urinals, and greywater systems.
- **Sept. 25 – Jerry Yudelson** of Yudelson Associates will discuss "New Technologies, Lessons and Opportunities in European Green Building Approaches." The session will be based on an upcoming Mechanical Contracting Education Research Foundation study on various European building technologies that can be used in the United States.
- **Nov. 20 –** The topic and speaker are still to be determined.

For more information or updates, log on to the MCAA's green website, www.greencontractors.us. ◦

Upcoming Events:

NSF Joint Committee on Plastics
August 6, 2008
Ann Arbor, Michigan

Canadian Advisory Council on Plumbing
August 25, 2008
Montreal, Quebec

Ontario Plumbing Inspectors Association Annual Meeting & Educational Seminar
September 7-10, 2008
Mississauga, Ontario

2008 International Code Council Annual Conference and Final Action Hearing
September 14-16, 2008
Minneapolis, Minnesota

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

IAPMO Annual Convention
September 28-October 3, 2008
Atlanta, Georgia

PHCC 126th Annual Convention
September 29-October 4, 2008
Atlanta Georgia

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

WaterSmart Innovations Conference
October 8-10, 2008
Las Vegas, Nevada

ASPE 2008 Biennial Convention & Engineered Plumbing Product Expo.
October 25-29, 2008
Long Beach Convention Center, Long Beach, California
http://www.aspe.org/new/Conv_Symp/conv-symp2008.php

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

Plumbing Surplus Website

From: *www.pmmag.com*

Plumbing and HVAC equipment is being purchased online at very low prices from the Department of Defense's exclusive surplus contractor, Government Liquidation — www.govliquidation.com. The Web site handles 11,000 transactions each month. Photos of most items are listed and there's no registration required to browse. ◦

PMI Launches Plumbing Site

From: *CONTRACTORmag.com*

The Plumbing Manufacturers Institute recently launched a new microsite, SafePlumbing.org, with the goal of updating old ideas about plumbing fixtures and fittings.

The site addresses topics such as lead in drinking water and the performance of low-flow toilets. It is designed for lawmakers, journalists, trade professionals and homeowners.

Besides separate pages on clean water, water efficiency, and health and safety, SafePlumbing.org also features a glossary of terms, as well as a guide to product markings on plumbing products.

Using the latest water-efficiency products added six hours per day of water usage time within the daily trucked-in allotments.

Additional information is available at 847/481-5500 or at www.pmihome.org/. ◦

WaterSmart Innovations Conference

From: *www.watersmartinnovations.com*

As the largest conference of its kind in the world, the inaugural WaterSmart Innovations Conference and Exposition will be held October 8-10, 2008, at the South Point Hotel and Casino, 9777 Las Vegas Blvd. So., Las Vegas, Nevada, on the south end of the famed Las Vegas Strip — just minutes from McCarran International Airport. This will be the premier venue for showcasing new water-efficiency technology to industry and business from around the globe; building and strengthening effective, interdisciplinary relationships and establishing your company as an international leader in innovative water efficiency technology and services.

For more information go to: www.watersmartinnovations.com. ◦

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