

TT 2021-06-01 DHW G.Klein BRedited

Gary Klein, Domestic Hot Water

Summary of the Links and Product references in the chat:

- 00:15:00 Shaun @ Vancouver: <https://news.gov.bc.ca/releases/2021EMLI0037-001013>
- 00:39:49 Justin Taylor - Tampa, FL: Q - how do atomizing shower heads, such as Nebia's, affects the pressure calculation? (<https://nebia.com/products/nebia-by-moen>)
- 00:44:13 Michael Lavigne: <https://www.iapmo.org/water-demand-calculator>
- 00:51:12 Carmel Pratt: H2O degree offers water monitoring hardware and tracking services: <https://www.h2odegree.com/> Enterprise Green Communities requires water monitoring in all affordable housing (funded by HPD/HCR) in New York City... a step in the right direction
- 00:55:50 Michael Lavigne: @ Gary, did you do a webinar with Watts (<https://www.watts.com/our-story>) or Caleffi (<https://www.caleffi.com/splash>) ? I'm getting deja vu.
- 00:57:48 Michael Lavigne: @Hal and Cindi- from the website: Provisions for using the WDC will be published in the 2018 UPC (<http://epubs.iapmo.org/2018/UPC/>) and 2017 WE•Stand appendices (<https://www.iapmo.org/we-stand/>) . Both documents will contain a download link for the WDC.
- 01:12:46 Cindi Anderson: There are watersense showheads, but they still don't necessarily have the neoperl pca? (<https://www.neoperl.net/en/oem/home/oemindustry.html>)
- 01:38:31 Gary Hamer, BC Hydro (he/him): @Gary, would you be willing to share your best practices to help the CSA Group (<https://www.csagroup.org/>) develop best practices in the design, installation and verification of domestic hot water systems. I am also interested in hearing your perspective on using electric heat pump water heaters. Sorry but I joined late?
- 01:39:55 Shaun @ Vancouver: <https://www.linkedin.com/in/gary-klein-b112592/>
- 01:52:02 Shaun @ Vancouver: gary@garykleinassociates.com
- 01:54:34 Rich: Does anyone have a link for the pipe in pipe system Gary mentioned? **

** Editor: Here's the link to which Gary referred:

<https://www.viega.com.au/en/resources/topics1/drinking-water-installations/smartloop-inliner-technology.html>.

01:56:39 Shannon Pendleton: Forbes | Passive Houses: The New Normal In The Architectural Industry
<https://www.forbes.com/sites/forbesbusinesscouncil/2021/05/28/passive-houses-the-new-normal-in-the-architectural-industry/?sh=15fddfbf5dd0>

01:59:27 Shannon Pendleton: Green Steel Manufacturing
<https://www.environmentalleader.com/2021/06/green-steel-the-next-big-thing-in-sustainable-manufacturing/>

02:05:03 Mark BareNaked Wille: NAPHN PreView Party this Friday at 10 Pacific:
<https://www.linkedin.com/events/previewparty-passivehouseforall6799006627778449408/> This link has expired.

02:05:39 Cameron Duncan: QuEST is a free, open source, Python-based application suite for energy storage simulation and analysis developed to bring Sandia energy storage analytics research tools to your desktop http://www.sandia.gov/ess-ssl/tools/quest/?utm_source=newsrele

02:09:00 Michael Lavigne: love talking about this stuff- if anyone wants to connect and discuss further: <https://www.linkedin.com/in/michael-lavigne-p-e-cphc%C2%AE-12476b20/>

Abbreviations used in the chat:

AAC	Augmentative and Alternative Communication (NB not Argumentative)
AHJ	Authorities Having Jurisdiction
BIM	Building Information Modelling
CSA	Canadian Standard Association
GPM	Gallons per minute
HPD / HCR in NYC	Housing Preservation & Development / Housing and Community Renewal, New York City
MF	Multi Family
PCA	Aerator with pressure compensating technology
PEX	Cross-linked Polyethylene
SFH	Single Family Home
SFD	Single Family Dwelling
WDC	Water Demand Calculator

00:07:11 Shannon Pendleton: Welcome Everyone! Happy Episode 26 :)

00:15:00 Shaun @ Vancouver: <https://news.gov.bc.ca/releases/2021EMLI0037-001013>

00:17:42 Shannon Pendleton: Include the 1st Nations Community in your good thoughts. Looking PHorward to getting into hot water and drinking from the PHire hose with Gary Klein 2nite!

00:23:40 Cindi Anderson: Hear hear. I find the PH community to be so amazing. So many logical, sensible people trying to make the world a better place in our own way, but still friendly and casual and fun.

00:26:23 Shannon Pendleton: This is the way ~ Less Volume Less Time!

00:26:25 Michael Lavigne: just keep your house at 140°F, no heat loss!

00:28:21 Francis: What is the typical hot water heater temperature in residential or commercial? Anyone familiar with it?

00:28:56 Michael Lavigne: minimum 120°F, 140°F is better to prevent Legionella anything above 125°F delivered in commercial will require a mix valve in most areas

00:30:27 Ellen Abramczyk: If you are rural on limited water supply it's filtered and softened water down the drain before you get to the hot water

00:30:35 Scott Kennedy: The time to tap depends on the fixture. At a lab I want it immediately. For a shower or a tub time is not an issue unless water conservation is an issue.

00:30:38 Francis: Is there a minimum water heater temp if they are used for hot water source for dishwasher machine in residential or commercial? Just curious

00:31:31 Michael Lavigne: most dishwashers (residential) are so efficient and use so little that they never get hot water (the lines are cold) so they have built in heaters. commercial varies- from just supply cold, to 180°F +

00:32:05 Hal - Rochester NY: water heater are not about the white box so it is not a archeure issue :-)

00:34:53 Francis: For residential, how much temperature rise of built in water heater? Is there a minimum of hot water temperature to supply to dishwashing machine?

00:35:34 Michael Lavigne: in the USA, hot water heaters are typically rated for a 77°F temperature rise.

00:37:05 Mark BareNaked Wille: @michael, where do you buy hot water heaters... in my town they only sell water heaters typically filled with cool water.

00:37:40 Michael Lavigne: I'm too weak for those- I buy mine empty

00:39:46 Cindi Anderson: You said dual core, right?

00:39:49 Justin Taylor - Tampa, FL: Q - how do atomizing shower heads, such as Nebia's, affects the pressure calculation? (<https://nebia.com/products/nebia-by-moen>)

00:40:02 David Salamon: how do you specify dual core flow regulators?

00:41:06 Francis: How about clothes washer? Anyone knew about hot water temperature to supply to clothes washer? Just Curious?

00:41:16 Ellen Abramczyk: In your architectural notes and hope someone reads them.

00:41:45 Marc Sternick: How much more are the dual-core, high performance aerators? Are they \$5 vs \$2 for normal (a no-brainer). Or are they \$20 each or more?...

00:41:45 Michael Lavigne: @Francis- those likely have built in heaters too

00:41:54 Susan Bilo: is that savings per month?

00:42:16 Cindi Anderson: and is it a specific thing you look for in a valve or is it in addition to the normal shower valve?

00:42:30 Scott Kennedy: The problem is the value of the real estate. Mechanical is typically relegated to the unused corners. \$40,000 per parking stall. \$1000+/sqft above ground.

00:42:36 Michael Lavigne: @cindi- they are in the fixture, typically. 5gpm whole building!

00:44:09 Cindi Anderson: @michael Lavigne Thanks, more expensive ones only, or many of them?

00:44:13 Michael Lavigne: <https://www.iapmo.org/water-demand-calculator>

00:45:02 Michael Lavigne: @ Cindi- not sure with the "high performance" version Gary showed- those are new to me. Most low flow fixtures in home depot had the normal ones that I saw... we size for the red line because some people build water heaters and have families to feed!!!!

00:46:44 Kyle Macht: When was that measured? What about in the morning or evening when water use might be higher.

00:47:14 Mark BareNaked Wille: Kyle this is at Peak

00:47:54 Kyle Macht: I typed too slow, I was referring to the previous graph of flow rates, oops

00:48:23 Ellen Abramczyk: Who designs the plumbing details in a SFD?

00:48:45 Cindi Anderson: So is he saying we oversize diameters to make sure we can achieve peak flow rates, but the peak flow rates aren't really that high and we can compensate for lower ones with better fixtures?

00:48:54 Trevor Fedyna: if you annotate your trunk/twig/branches with ID's for the unit number/type in your BIM: you may make your/your consultants day when it comes to PHIUS pipe calcs .. :D

00:49:34 Ellen Abramczyk: isn't the flow only critical for certain appliances, like washers?

00:49:48 Justin Taylor - Tampa, FL: Q - if you undersize the pipes, what kind of regulatory pushback could we expect (from like code enforcers)?

00:50:15 trothstein: I would love to measure building flow rates. I need to learn which devices are available to purchase.

00:51:12 Carmel Pratt: H2O degree offers water monitoring hardware and tracking services: <https://www.h2odegree.com/> Enterprise Green Communities requires water monitoring in all affordable housing (funded by HPD/HCR) in New York City... a step in the right direction

00:53:15 Shannon Pendleton: 5k! That will pay for my monitoring :) :)

00:53:40 Francis: Does water demand calculator calculation accept nationwide or only specific area in the country?

00:53:45 Shannon Pendleton: Luv it!

00:55:29 Robert Kelly's ipad (2): Q : Does the choice of tubing... plastic vs copper play a factor in heat loss ? Or are you assuming a basic amount of insulation around every pipe?

00:55:50 Michael Lavigne: @ Gary, did you do a webinar with Watts (<https://www.watts.com/our-story>) or Caleffi (<https://www.caleffi.com/splash>) ? I'm getting deja vu.

00:56:03 TOR - Andrew Peel: Do you have any data for condos? Would you expect water demand in condos to be higher than apartments?

00:56:54 Cindi Anderson: Is there really an ability to do this with a SFH or is it basically set by code?

00:56:55 Hal - Rochester NY: Q - do you get push back from the building inspectors?

00:57:48 Michael Lavigne: @Hal and Cindi- from the website: Provisions for using the WDC will be published in the 2018 UPC and 2017 WE•Stand appendices. Both documents will contain a download link for the WDC.

00:58:26 Cindi Anderson: @Michael Thanks I'm actually in US so I'll have to find out for here.

00:58:43 Michael Lavigne: i think that covers about half of AHJ's

00:59:00 Shannon Pendleton: Thanks Michael :)

00:59:47 Michael Lavigne: most inspectors are cool with anything if an engineer will stamp it (take all liability)... finding one to do that...? another issue.

00:59:58 Ellen Abramczyk: This was fascinating! Thank-you

01:00:13 Ian Robertson: Normally these talks are firehoses of information ... this is a PHirehose (correctly sized)

01:00:14 Shannon Pendleton: Questions first from Francis; Justin Taylor (2); David Salamon

01:00:22 Marc Sternick: Will these slides be available?

01:00:28 Robert Kelly's ipad (2): Brilliant work!

01:00:30 David Salamon: would love to see some examples of architectural changes as a result of Gary's interventions

01:01:44 Scott Kennedy: Have you considered electric resistance heating at the lavatory sinks?

01:03:49 Sharad Patel: I have a Nebia since inception. It is cold and had to change the temp setting. The new Nebia does a better job

01:04:07 Peter H. Molenaar: Yes Gary, and tall people need higher shower heads.

01:04:55 Shannon Pendleton: David Salamon; Marc Sternick; Susan Biló Up next

01:05:17 KARIENA's iPhone: I have the original nebia, unopened if you want to test it!

01:06:11 Carmel Pratt: What are the best design interventions that = biggest impacts you've seen to reducing piping volume for central storage DHW systems in large (mid/high-rise) MF buildings?

01:06:14 Cameron Duncan: Larger project, different use: Recreation Center...What recommendations would you suggest our plumbing engineer use to sizing the plumbing for our PH recreation center? Use any particular calculator? v.2 IAPMO Water Demand Calculator?

01:06:29 Scott Kennedy: Have you looked at systems that engage a re-circ pump from hot water to cold water in single family on an occupancy sensor until hot water arrives?

01:06:37 Michael Lavigne: again for reference:
<https://www.iapmo.org/water-demand-calculator>

01:06:46 michael ingui: Great presentation - have a meeting and need to jump - see you all tomorrow.

01:07:06 Peter H. Molenaar: Q ; Rainfall shower heads are all the rage recently. How much pressure can be achieved with all those holes ? 🕳️ I also prefer a strong flow shower.

01:07:29 Cameron Duncan: Follow-up for Rec Center: What do you suggest we have installed to monitor the plumbing?

01:08:20 Cindi Anderson: ditto @scott Kennedy's question on recir pumps

01:09:25 Tom White, Eden Housing: Q: did you do any post occupancy evaluations of customer satisfaction in the new multifamily buildings you showed with the reduced pipe sizes and peak flow rates?

01:10:23 . . : what about point of use inline water heaters? either to just use to stop lag or instead of tank or tankless?

01:10:41 Scott Kennedy: Have you looked at systems with heat pipes tied to the cold water side of the shower? Hot water savings?

01:11:51 Susan Bilo: I'm going to share this recording with the National Affordable Housing Networks folks!

01:12:37 Michael Lavigne: that man is a hero.

01:12:46 Cindi Anderson: There are watersense showheads, but they still don't necessarily have the neoperl pca (<https://www.neoperl.net/en/oem/home/oemindustry.html>)?

01:13:11 jeff: Gary, tell them about Tim's pipe in pipe too*

01:14:23 Paul Latter: This is great and will have to take in the recording again when it is released. Thanks again for a great presentation

01:14:53 Kyle Macht: Do you believe plumbing walls should be prefabricated for increased efficiency?

01:15:01 jeff: Gary, Do you think your efficiencies can apply to sprinkler systems??

01:15:11 Shannon Pendleton: Thanks great questions David

01:15:43 Michael Lavigne: @Jeff- they have residential sprinklers that are low-lead so you can actually use your cold domestic water lines

01:16:47 Rich: How many Psychiatrists does it take to change a light bulb?
It's irrelevant, the light bulb has to want to change.

01:17:12 Shaun @ Vancouver: @rich LOL

01:17:37 Rayan Ghazal: shout out to Sharad!

01:20:17 David Salamon: thank you Gary!

01:20:40 Susan Bilo: yes, thank you VERY much!

01:21:05 Daniel Glauser: thank you everyone!

01:21:10 Ellen Abramczyk: Thank-you

01:21:12 Peter H. Molenaar: Q ; so Gary, you're suggesting to have all the principal
stakeholders to stop designing in a vacuum or as silos ? Is collaborative design the path to success?

01:21:40 Ian Robertson: @Peter ... so basically unlike almost every project which
ever happens :-)

01:21:56 Susan Bilo: These sessions rock! Thanks, Susan

01:22:38 Ian Robertson: (but which it would be so nice if it could happen! ... it would
help so much if all buildings were coordinated as well as that one the other week ... BIM
Supermodels for the win!)

01:22:44 Daniel Levy: @Gary—great presentation, as always! My camera is off
until I finish dinner—though if it was on maybe someone would feel sorry for me and deliver
something better....(I'm the guy who builds with AAC.)

01:23:31 Sharad Patel: architects and mechanical engineers are clueless about this
subject matter - hence the major issues post design !!!

01:24:00 Cindi Anderson: @sharad Agreed.

01:24:40 Michael Lavigne: @Sharad and Cindi- OUCH!

01:24:42 Cindi Anderson: @sharad And they tell you they do because they are too
ignorant to know that they don't know. Haven't even heard of this.

01:25:38 Shannon Pendleton: Next questions from: Marc Sternick; Susan Bilo; Cindi
Anderson

01:26:00 Cindi Anderson: Everyone I asked "do you do efficient plumbing design" and
they say "what?" Except Positive Energy in Austin.

01:27:45 Michael Lavigne: XXL tee-shirt only

01:29:52 Mark BareNaked Wille: After the Q from Cindi can we get back to Gary's answer to
Davids comment

01:30:53 Kazuko Ono: Thank you so Much, Have to leave. Always so informative
and inspiring

01:31:00 Shannon Pendleton: Next questions: Cindi Anderson (2); Robert Kelly's; Michael
Lavigne

01:31:15 Shaun @ Vancouver: Thanks for joining us tonight @Kazuko

01:32:09 Susan Biló: skbilo@gmail.com for Gary

01:32:32 Cindi Anderson: related to the size of the pipe

01:34:03 Shannon Pendleton: Cindi Anderson; Michael Lavigne; Andrew Peel up next

01:35:36 Hal - Rochester NY: Q : what is the good stuff for pipe insu

01:36:02 Peter H. Molenaar: Mark ;-) that's not what I was taught in in Mechanical Engineering school.

01:38:31 Gary Hamer, BC Hydro (he/him):@Gary, would you be willing to share your best practices to help the CSA Group (<https://www.csagroup.org/>) develop best practices in the design, installation and verification of domestic hot water systems. I am also interested in hearing your perspective on using electric heat pump water heaters. Sorry but I joined late?

01:39:55 Shaun @ Vancouver: <https://www.linkedin.com/in/gary-klein-b112592/>

01:40:14 Adam - Danish Red Cross: how much does that cost? haha

01:40:38 Rayan Ghazal: Thank you Gary!

01:41:25 Shannon Pendleton: Michael Lavigne; Andrew Peel; Hal - Rochester NY (2); up next :)

01:42:47 Jonathan Shambare, Alaska: Gary can you talk about PEX vs Copper for water piping?

01:46:16 Andrew Peel: 0.9 vs 0.1

01:46:19 Adam - Danish Red Cross: thanks everyone...super interesting...now I have some powder to speak with our designers...good night

01:47:43 Shannon Pendleton: Thanks Andrew ~ See you next time! *Adam :)

01:48:08 Andrew Peel: same principle applies to foil coated foam wall insulation that faces an air cavity

01:48:36 Peter H. Molenaar: Hear, Hear, for Thermal Dynamics class.!

01:49:11 Shaun @ Vancouver: yes PH Molenarr, lots of amazing lessons tonight

01:50:34 Robert Kelly's ipad (2): Thanks for an excellent presentation and back up inPHormation

01:52:02 Shaun @ Vancouver: gary@garykleinassociates.com

01:52:47 Juergen Korn: Do you find a big difference in maximum flow in Seniors housing compared to apartments / condos for the working crowd?

01:52:48 Cameron Duncan: Thanks, much, Gary! TerriPHic!

01:52:53 Carmel Pratt: Thanks Gary!

01:53:07 David Wotten- Toronto, Canada: Thanks Gary

01:53:20 Cindi Anderson: Thanks!

01:53:20 Juergen Korn: Thanks Gary!

01:53:27 Hal - Rochester NY: thanks gary

01:53:30 Andrew Peel: thanks for the fire hose!

01:53:31 Rich: This is the best one yet!!

01:53:31 Justin Taylor - Tampa, FL: Awesome presentation!! thank you for your time!!
And for explaining everything!

01:53:52 Peter H. Molenaar: Gary, thank you for the terriPHic presentation !

01:54:12 George Nickel: Thanks for a great presentation. Good night!

01:54:16 jeff spiritos: Gary Klein for DOE head!

01:54:34 Rich: Does anyone have a link for the pipe in pipe system Gary mentioned? **

**** Editor: Here's the link to which Gary referred: [viega smartloop](https://www.viega.com/smartloop)**

01:54:39 Shannon Pendleton: Michael Lavigne; Andrew Peel; Hal - Rochester NY (2); up next :)

01:55:03 Peter H. Molenaar: What diameter was that PHire hose of knowledge ?

01:55:36 Rich: And what thickness is the insulation on that PHire hose?

01:56:05 Cindi Anderson: Oh bummer.

01:56:20 Louisa Bradford in RI: Great presentation and energy. Thanks PH Accelerator!

01:56:39 Shannon Pendleton: Forbes | Passive Houses: The New Normal In The Architectural Industry
<https://www.forbes.com/sites/forbesbusinesscouncil/2021/05/28/passive-houses-the-new-normal-in-the-architectural-industry/?sh=15fddfbf5dd0>

01:57:06 Cameron Duncan: Getting the design team—from architect to specialists (plumbing engineer in this case)—OMG! How to coax out of them the full design you seek. What're some of the steps we should consider taking to move them out of their Std.Spec., out of their box, and into truly creative, strong, efficient design?

01:58:15 jeff spiritos: Hats off to the PHA team. You guys/gals are AWESOME

01:59:27 Shannon Pendleton: Green Steel Manufacturing
<https://www.environmentalleader.com/2021/06/green-steel-the-next-big-thing-in-sustainable-manufacturing/>

01:59:36 Peter H. Molenaar: PH needs to be the new normal long bePHore 2030 ! Right, Mark ?

02:00:55 jeff spiritos: not coffee

02:01:06 Peter H. Molenaar: PHour Seven PHive !

02:01:13 Shannon Pendleton: not coPHee
02:02:00 Peter H. Molenaar: Not coPHPHee !
02:03:42 Cindi Anderson: I have posted there but there's not a lot of activity :-(
02:04:42 Peter H. Molenaar: Requires an upgrade to the diameter of the PHire hose.!

02:05:03 Mark BareNaked Wille: NAPHN PreView Party this Friday at 10 Pacific:
<https://www.linkedin.com/events/previewparty-passivehouseforall6799006627778449408/> This link has expired.

02:05:39 Cameron Duncan:
Quest...ww.sandia.gov/ess-ssl/tools/quest/?utm_source=newsrele ...QuEst is a free, open source, Python-based application suite for energy storage simulation and analysis developed to bring Sandia energy storage analytics research tools to your desktop
http://www.sandia.gov/ess-ssl/tools/quest/?utm_source=newsrele

02:09:00 Michael Lavigne: love talking about this stuff- if anyone wants to connect and discuss further: <https://www.linkedin.com/in/michael-lavigne-p-e-cphc%C2%AE-12476b20/>

*Pipe-in-pipe system:

<https://www.sciencedirect.com/science/article/pii/S1571995201800386>

“A pipe-in-pipe system is essentially made up of an insulated inner pipe and a protective outer pipe. The function of the inner pipe is to convey fluids; therefore, it is designed for internal-pressure containment. The inner pipe is insulated with thermal insulation materials to achieve the required arrival temperature. The outer pipe protects the insulation materials from external hydrostatic pressure and other mechanical damage. Concrete weight coating is not normally required because of high submerged weight and low ocean-current speeds in deepwater areas. For the exploitation of high-pressure/high-temperature (HP/HT) reservoirs, a pipe-in-pipe system can provide the necessary thermal insulation and integrity for transporting hydrocarbon at HT and HP. A pipe-in-pipe system comprises a rigid steel flowline inside a rigid sleeve pipe. The two pipes are kept apart by some form of spacer at the ends of each joint and by bulkheads at the ends of the pipeline. The air gap between the inner and outer pipes provides the means of achieving the high thermal insulation. This air gap accommodates the insulation, which typically consists of either granular material poured into the interpipe annulus or a blanket form, which is wrapped around the inner pipe. In either case, the insulation material needs to be kept dry to maintain its insulation properties.”

**I tried to find the video segment where Gary mentions pipe-in-pipe, but it occurred in the afterhour, so not included in the video. Perhaps an argument for recording the afterhour?

2021-07-08 UPDATE: I asked Gary for the link he mentioned: he provided it and I've added it to the links at the top of this conversation