

FALL 2021

# Sheet Metal Journal

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Western Washington

## citizenM

The future of construction in hospitality

*Also in this issue:*

**Construction for Change**

**Insulation Specification**

Publications Mail / Agreement  
# 40719512



**SMACNA**  
WESTERN WASHINGTON  
Official Journal of  
Record for SMACNA-WW

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The ultimate goal of SMACNA-Western Washington, Inc. is to achieve and maintain the following principles and programs for the sheet metal industry:

1. To establish advertising, publicity, and promotional activities that advise the public of the nature, extent, and availability of services performed by the industry.
2. To promote educational programs to formulate high quality standards of sheet metal construction.
3. To aid in the formulation of uniform sheet metal specifications and improvement of state and municipal codes.
4. To expose fraudulent or misleading advertising or representations intended to deceive the public.
5. To encourage and promote trade practices that will eliminate unfair competition or exploitation of the sheet metal industry.
6. To encourage and promote the establishment of a uniform pattern of payments by customers during the progress of jobs to avoid inequitable payment delays and economic penalties.
7. To provide a forum for the discussion of the common interests and problems of labor and industry, and to encourage and promote harmonious relations between labor and industry.
8. To encourage any proper activity that will increase the efficiency of the industry and its ability to serve the public.



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Western Washington

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**ADIEU, 2021**

We are nearing the end of the year and, along with sleigh bells and the tinkling of eggnog glasses, whispers of optimism are in the air. Collectively, the sheet metal industry has weathered nearly two years of business as anything but normal, and overall, perseverance has ruled the day. Moving into 2022, predictions are that bottlenecking the supply chain may start to ease by Q3 and a cooling of the residential market is rumoured to mean a boost for commercial and institutional. It is especially in times like this that SMACNA contractors and their labor partners bring tremendous value to the construction climate. Their solid reputation for high standards and skilled craftsmanship is known far and wide, and when there are fewer dollars to spend, it makes sense to spend them where the most value exists.

This issue of *Sheet Metal Journal – Western Washington* showcases Construction for Change and the incredible work it has done with its partners in the sheet metal industry. Although it has completed projects across America and the world, the level of participation among Western Washington contractors is truly impressive. The Palette Sheltering Initiative provides homes for the homeless in various regions, and the Heavy Metal Summer was a joint recruitment effort between Hermanson Company in Washington and Western Allied in California’s Bay area. Turn to page 8 to learn more about these initiatives and the contractors who made them possible.

Holmberg Mechanical and its labor partners at Local 66 showcased their skill and ability at citizenM, an innovative, tech-savvy (and covid-proof!) hotel project with a front row seat to Puget Sound. Besides a high environmental rating, a state of the art heat and cooling system, and razor-thin tolerances, the project offers a glimpse into the future of hotel construction. “The project gave us some real-world insight on what we may be seeing more of in the future as technology keeps transforming our industry,” says Chris Ebbert, Holmberg Mechanical’s HVAC project superintendent. See page 12 for more about this project.

And finally, whether you love a good productive crowd or feel your best when squirrelled away in peace and quiet, you may



By / Jessica Kirby  
Editor, Sheet Metal Journal-Western Washington

benefit from a peer-networking group. It is the best place for open, evidence-based advice from a group of your peers and the perfect opportunity to beat isolation while becoming a better leader and person. Find out how to participate on page 5.

On behalf of the team at Point One Media, I want to extend my warmest wishes for a happy, restful, and safe holiday season. We look forward to working with you again in 2022. ▪



**UPCOMING SMACNA-WW MEMBERSHIP EVENTS AND OBSERVED HOLIDAYS**

**November 16, 2021**  
Labor-Management Industry Night, Kevin Brown • SeaTac Hilton

**December 3, 2021 \*\*\* NEW LOCATION \*\*\***  
Annual Holiday Gala • W Hotel, Bellevue

**Thursday, December 23-24: Christmas Holiday**

**March 1-2, 2022**  
Partners in Progress Conference • Las Vegas, Nevada



## THE POWER OF PEER GROUPS AND NETWORKING

I think we can all agree that connection is imperative these days. The extroverts in the crowd know this in their bones and tend to make focused, intentional efforts to connect with others—not only does it give them energy to do so, it also helps us all weather the storm of unusual times, say, when a pandemic keeps everyone apart for two years.

Even the most reserved of us, those who work best and draw energy from being alone, can agree on the importance of knowing there is someone else out there with whom to share feedback, bounce ideas around, collect and deliver constructive criticism, and add value to one's own work. For this group, "connection" might mean from afar—by phone, by email, by Zoom—but this is no less important for mood, productivity, and overall good work health.

In the spirit of connection, enter the peer networking group—a subject- or business-specific group of individuals who resolve to come together (in real life or remotely) to stay connected. Members may bring issues or questions about their industry to the group with the hope of benefitting from a broad range of experiences. In sales-focused groups, members are often from diverse geographic regions to avoid competitive overlap from interfering with honest, poignant feedback and advice. A peer group might identify a problem or issue common to everyone in the group and study it together, because this often unearths alternative solutions no one previously considered or brings to light ideas that may have gone unnoticed. If the alternative solution is something someone else in the group had tried, group members benefit doubly by the idea and the other person's experience with it.

The nice thing about peer groups in contemporary times is the efficacy that technology has lent their development. Thanks to a nearly seamless pivot for most, they continue to bring to everyone's finger tips a broader, more robust professional network. With just a few clicks, we can access someone whose judgement and experience we trust and value, and we can reap the benefits of providing that support and resource to others.

CIO-turned-executive coach Steve Heckler says in an article for Heller Search Associates that nearly two-thirds of executives do not receive outside leadership advice, but nearly all want it. "As leaders, who do you turn to when you need some help, advice, or just want to kick around some new ideas?" he asks. "Or what if you want to find out about experiences with a particular vendor or consultant?"

Peer groups, or communities of practice (COP), as he calls them, are the perfect solution for decreasing isolation and creating a feeling of community. "Whether it is the public or private sector, regardless of industry, peers are all facing

similar challenges," Heckler says. "It is important to realize as an executive that you are not alone in the obstacles your face on a day-to-day basis."

Naturally, successful peer groups require some solid ground rules. With membership comes responsibility, which means each member must be accountable to the group, commit to bringing value, be open to feedback (even when it is uncomfortable), and be willing to give feedback in an open, constructive and respectful way. And what happens in a COP stays in a COP—these groups are 100% confidential, no exceptions. That commitment is the only way members can feel safe from judgement to express themselves and share their ideas. Participants must be willing to show up, prepare for meetings or exchanges, engage openly and honestly, ask for help, and believe firmly in actively maintaining an environment of trust, respect, and safety. Usually the biggest roadblock to a successful COP is finding time to meet regularly, but looking back, members never regret having made the time.

"After joining, members find that making the time for the meeting pays quick dividends," Heckler says. "Those who have made the investment usually come away from each session with several nuggets that prove to be invaluable."

Peer-to-peer networking works for every level of business where a genuine interest in learning and growing exists. Most people learn better from direct peers (so individuals at the same corporate level), and these relationships tend to foster greater trust and easier relationship building. Besides getting up to the minute, firsthand advice on new ideas, products, systems, and solutions, it is powerful to be able to say to one's board, executive, or fellow employees that you spoke to five other individuals in this same business or industry situation and they are all dealing with it the same way or implementing the same solution.

When corralling a peer group, consider a group of six to ten participants, keeping in mind a smaller group gives more people the chance to contribute and a group larger than 12 presents the risk of some voices being lost. Of course, over time members may not make every meeting, so over-stacking the roster might work out to the group's advantage in the long run. Concerns about participation and contribution can be mitigated by a facilitator or a moderator—the same person or someone different each meeting whose job it is to handle logistics and notes or minutes for the meeting, establish the vibe in the group for that session, keep participants on track, and gently engage quieter members.

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**SMACNA-WESTERN WASHINGTON CODE AND TECHNICAL COMMITTEE**

With new technologies and environmental challenges emerging at a faster rate than ever before, SMACNA-Western Washington’s code and technical committee has the responsibility of sifting through these changes on behalf of members to educate them on the key components of each new issue.

“Whether it’s new code language or new equipment, material, or installation innovations, our group reviews and interprets these new ideas to help our members keep current on what’s changing and how it might affect their business,” says Peter Boileau, chairperson of SMACNA-WW’s technical committee. “In a sense, we are trying to raise the awareness flag for this type of issue for all our SMACNA partners so they don’t have to discover this information independently—and potentially too late in the execution of their projects.”

Boileau joined the committee because he was inspired by the work of the SMACNA-Western Washington leadership group.

“In my 30 plus years in this industry, I have rarely experienced a group that is not only focused on helping everyone equally, but also providing that help in an encouraging and fun way on every issue they touch,” he says. “It’s the positive energy and can-do attitude of this group that inspired me to get involved.”

Boileau brings a wide range of experience to the group as a licensed mechanical engineer who has designed all types of mechanical systems. He has also worked for general contractors providing mechanical coordination on both commercial and industrial projects, and has spent more than 20 years as a mechanical contractor, estimating and managing both design and construction projects.

The technical committee’s objective in providing value to the membership is to enhance members’ understanding of both code and technical issues as they effect the sheet metal industry.

“Our building and energy codes are continually changing to improve life safety, comfort, and energy efficiency in the buildings we build,” Boileau says. “The technology we use to build our projects is also continually changing, and it’s our responsibility to keep our members up to date, knowledgeable, and competitive as these changes occur.”

Over the years, the committee, which was founded more than two decades ago and currently has 13 members, has been challenged by interpreting new code language, especially the recent updates to the International Mechanical Code. This latest code addition is more complex to understand, as there is a significant reorganization of code topics, as well as revisions to code language.



“The committee spent months combing through the new code section by section to gain a consensus in understanding how the code language and organization changed,” Boileau says. “We have published our interpretations of these significant changes in past Sheet Metal Journal – Western Washington articles.”

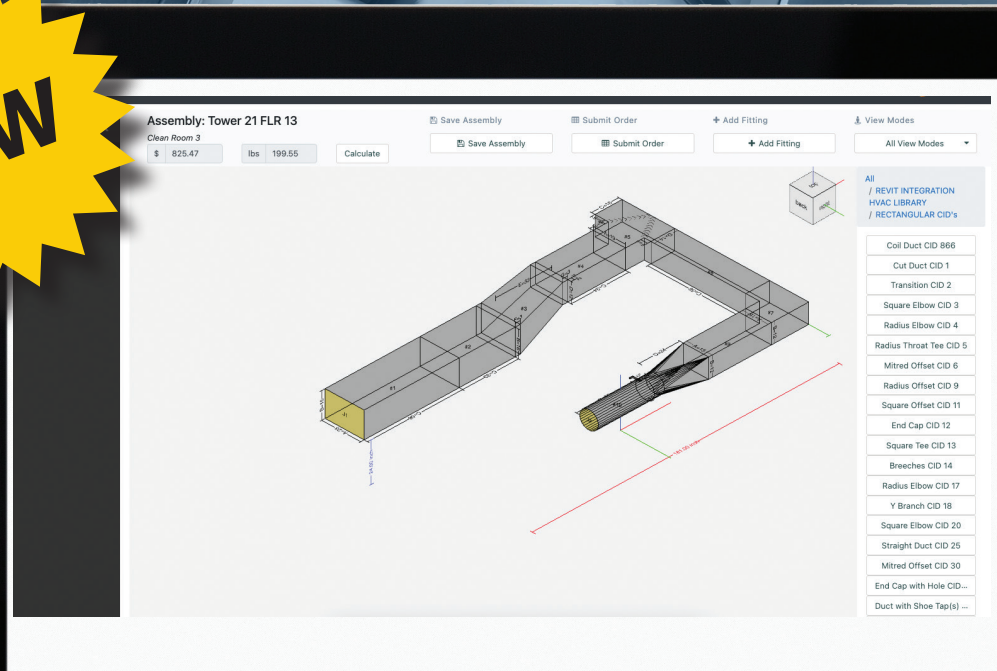
The main goal of the technical committee is to stay in front of evolving codes and technology (including new products and methods to build the industry’s work) to help SMACNA-WW members be prepared and minimize disruptions to their business.

“The code committee is made up of a healthy mix of construction professionals who administer and build our work, plus plan reviewers and building inspectors to provide input on how they interpret industry changes and code revisions,” Boileau says. “This mix makes for enjoyable committee meetings with lots of lively discussions from different perspectives.” ▪



# INTRODUCING THE BUILDCENTRIX ASSEMBLY BUILDER

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# Construction for Change

Making the world a better place, one construction project at a time



By / Jessica Kirby • Photos courtesy of SMACNA-Western Washington members

Construction for Change (CfC) has been engaged with SMACNA over several years on initiatives that are making an important difference globally and in the United States. It is a 501 c3 non-profit in the state of Washington, and it exists to help other non-profits, NGOs, and government ministries build social infrastructure, like schools, hospitals, and other facilities that promote economic empowerment, job training, and social improvement. These initiatives focus on global and domestic locations that are under-resourced and where it is challenging for children and families to escape poverty.

“It started in 2008, and until 2016 was averaging two to four completed projects a year,” says Kevin Hunter, executive director for Construction for Change. “We are proud to say that over the last five years we have averaged 14 project annually, and in 2022, we will go over the 100 completed projects mark. Over the last four years we have grown our staff capacity, and without our incredible project staff and volunteers we wouldn’t have been able to hit these impact targets.”

CfC has continued to expand its base in terms of its scale and the size of its projects. It just opened an East African office and it working on opening one in West Africa. It has also grown its project list in the United States, thanks in no small part to help from SMACNA contractors and their labor partners.



Two main initiatives on which SMACNA and CfC have partnered include the Pallet Shelter Initiative and the Heavy Metal Summer Experience.

The first is the sheltering initiative, which involves mobilizing and deploying skilled trades people from SMACNA mechanical contractors and labor or apprentices to assemble and build emergency shelters for the homeless populations around the country. In the second initiative, CfC partnered with Hermanson Company in Western Washington and Western Allied Mechanical in California to pilot summer camps that bring high school students together for six weeks and expose them to a meaningful career in the trades.



*“The SMACNA leadership and membership are the perfect partners for these types of community collaborations,” says Kevin Hunter, executive director, Construction for Change.*



“The SMACNA leadership and membership are the perfect partners for these types of community collaborations,” Hunter says. “They represent thousands of skilled craftspersons, interested in creating positive community impact as well as having a keen desire to expose the next generation skilled tradespeople to a meaningful and economically lucrative career path. They have been so very diligent in helping us build new relationships around this work and across the country.”

### **Pallet Shelter Initiative**

Construction for Change and Pallet Shelters have combined forces to bring forth a nationwide initiative to promote stable temporary housing units that are safe, secure, and dignified.

The shelters, manufactured by Pallet, are either 64 square-foot or 100 square-feet, and able to house two to four people. They are outfitted with beds, climate control, safety features, electricity, and more. They are made from highly durable aluminum and composite materials and can be built in less than one hour. Pallet shelter villages can be built at a fraction of the cost of traditional homeless shelters and are proven to help people transition into permanent housing.

Numerous SMACNA contractors, including Holmberg Mechanical in Western Washington and General Sheet Metal in Portland, have stepped up to volunteer their time and skills in to efficiently assemble 300 shelters in the NW region. By August 2021, contractors and tradespersons in the SMACNA network had built their 250th shelter, an accomplishment achieved in less than a year of collaboration, amounting to 1,000 hours over 132 days. These shelters will accommodate 500 individuals looking to get back on their feet.

SMACNA-WW invited Holmberg Mechanical to help construct a new 30-unit community, and the company supplied its union craftspeople for this endeavor.

“The response I received from our workers was positive and wonderful,” says Angela White, Holmberg Mechanical’s marketing and public relations manager. “They enjoyed helping people in need and using a different side of their craft and skillset. I visited the site while it was happening and it was inspiring to see so many people working well together for a common goal.”





Holmberg plans to contribute to more CFC initiatives in the future because they believe in the organization's mission to help locally and globally and deliver professional, community-centric assistance to people in need and provide opportunities for careers in construction.

"My key takeaway from the Pallet Shelter build is that a lot can be accomplished in one day's work when union craftsmen and craftswomen are involved," White says. "The speed and accuracy I saw with my own eyes was incredible. And they were working side by side with competitors. Many men and women in Everett, a city in our own community, reaped the benefits of these professionals and the companies who generously donated their time to help. All around, it was a win-win."

### Heavy Metal Summer Experience

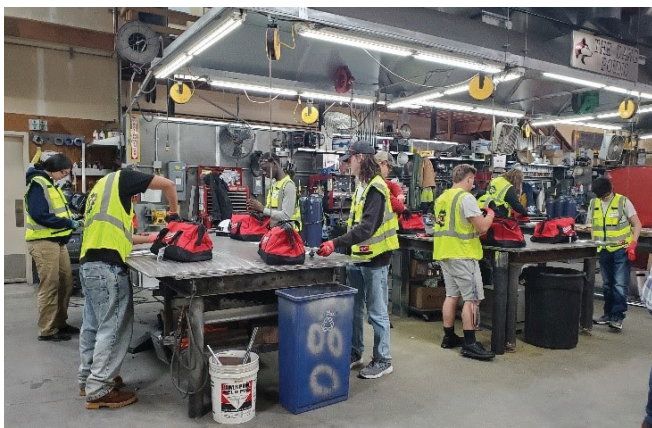
HMSE brought high school seniors and recent graduates into the shop twice a week for six weeks where they made projects, learned about safety and careers, and how to go through the apprenticeship process and class work.

"We are all aware of the current and looming shortage of skilled trade workers across the nation," Hunter says. "The HMSE project was a powerful experience for upper level high school youth to experience first hand what a career in the trades could look like. It is hands-on and high exposure experience that we believe will steer a big percentage of the graduates into a great career in the trades."

Jana Burbank, Hermanson Company LLP, says HMSE was meant to make an important difference to the construction industry's labor needs. "The main goal was to introduce high school students to the trades and show them there are other avenues for post high school education and sustainable careers outside of attending a four-year university program," she says.

Hermanson hosted the HMSE camp in the Seattle area, and SMACNA Bay Area member Western Allied Mechanical hosted a camp, as well. "The intention is not just for Hermanson and Western Allied to host these camps every summer," Burbank says. "We want to grow it beyond us and have other contractors host them all across the county."

Julie Muller, executive vice-president for SMACNA-WW is on CFC's board of directors and is the organization's chair elect. Her assistance has been invaluable bringing SMACNA members together with opportunities to make a difference with CFC.



“Julie was a key component in our involvement,” Burbank says. “When we first started discussing the HMSE idea, it was Julie who suggested partnering with CfC. They were instrumental in managing this large initiative.”

CfC worked side by side with Hermanson and Western Allied to help create a “Playbook” other contractors can use to host the camps. “That way they don’t have to start from scratch,” Burbank says. “They can use our Playbook for nearly all the information they will need.”

CfC will be launching an HMSE expansion phase over the next year and hope to have ten camps or summer experiences next year. “We will be looking to double the number of summer experiences each year over the next three years with 10 in 2022 then 20 and then 40 in year 2024,” Hunter says. “We are hoping for a long waiting list of firms that want to join the movement that will allow us to expand even more quickly.”

### 30/30 Project

Johansen Mechanical began participating in CfC initiatives around five years ago when it was a co-supporter on the 30/30 Project, which retrofitted a parking lot into garden space for newcomers to the United States and repurposed space in the adjacent church for communal indoor and outdoor kitchens. The company is about to begin construction on six large stainless steel countertops totalling 140 square feet for the 30/30 Project’s outdoor kitchen.

“We participated because it was a way to support SMACNA partnerships with organizations in need and strengthen our community involvement,” says Keith Johansen, owner of Johansen Mechanical. “It feels good to make a difference. One of our key values is making a difference to our employees and the community. This isn’t just a job—we are trying to give back to the community that has given us so much.”

Hunter says the team at CfC feels grateful to have charitable local organizations like the SMACNA network as partners to help mobilize these community projects. “We facilitate the relationship between the great need for social infrastructure and the generosity of the construction sector to better the community and the industry,” he says. “It is a great partnership and we couldn’t be more proud to be a part of it.” ■





# Introducing citizenM

Unique Boutique High-Tech Hotel Coming to Seattle Waterfront

By / Angela White

**When it comes to making guests feel special,** Dutch hotel brand citizenM is leading the way and bringing its version of modern hospitality to Seattle for the second time. A pandemic-proof hotel chain before it was cool, thanks to innovative, contactless stay amenities, citizenM Pioneer Square was a project Holmberg Mechanical enthusiastically pursued. CitizenM has it all—an excellent location, beautiful concept, and meaningful addition to the neighborhood. How could Holmberg resist? With the removal of the noisy viaduct, guests at the hotel will have unobstructed views and a front-row seat to the Puget Sound.

Checking in and out has never been faster, thanks to citizenM's innovational app, which proudly boasts a record-setting 60-second check-in and 30-second check-out. This tech-savvy hotel comes equipped with MoodPads, an iPad-like device custom for each room. Guests can also download the hotel's app and use it as a room key, as well as schedule housekeeping. Lights, blinds, TV, and more can be controlled with a few thumb swipes. The technology doesn't stop there, as the hotel will be monitored in real-time to ensure an

optimal guest experience. Each shift requires only a few staff members to keep things moving smoothly, too. The hotel brand doesn't nickel and dime its guests, so all movies and WIFI are available at no additional charge. Each room comes with a wall-to-wall king-size bed. Guests will appreciate on-demand fitness videos, like yoga, and exclusive Brainwaves soundtracks to aid sleep.

citizenM is highly conscious of quality, and it is environmentally and sustainability-driven in the construction and operation process. Its fully integrated model aids with design by following the proven methods of success of from previous hotels and by implementing new ones. Leadership in Energy and Environmental Design (LEED) Gold accreditation is achieved by applying energy-efficient technologies and systems.

Holmberg Mechanical is performing the full design-build scope at citizenM. Comfort is provided by a variant refrigerant flow (VRF) system with condensing units located on the roof. Individual fan coil units hung in each guest room provide outside air supplied by a rooftop dedicated outdoor

# M

“The project gave us some real-world insight on what we may be seeing more of in the future as technology keeps transforming our industry,” Chris Ebbert, Holmberg Mechanical’s HVAC Project Superintendent.

air system (DOAS). Room exhaust is supplied by rooftop fans through a subduct system. The return air cans have to be centered within a 1/2” on rough-in to accommodate the pre-manufactured metal ceiling panels along with the exhaust duct centered to a glass shower panel with a 1/8” tolerance.

Other challenges on this project include the lack of a laydown area, due to a non-existent parking garage. The project also includes custom pre-manufactured cohesive European shower pods. These products require the highest attention to detail on all rough-in and trim activities. This project is just across the ferry lanes, which are currently under construction, so street usage is extremely limited.



in itself, due to the build-out of the structure from L5 to the roof,” says Chris Ebbert, Holmberg Mechanical’s HVAC project superintendent. “Levels 1 to 4 are typical post-tension concrete slabs, and starting at level 5 all walls and ceilings are prefabricated structural metal walls with pan decking.”

The prefab walls had to take into effect all penetrations for MEP trades through the coordination process, including all penetrations for duct, fire, and smoke dampers, and refer line routing. All of this had to be coordinated through the BIM process, in an already condensed and congested ceiling space.

“The project gave us some real-world insight on what we may be seeing more of in the future as technology keeps transforming our industry,” Ebbert says.

Holmberg Mechanical’s Project Manager, Carter Johnson says the project introduced the team to a fascinating approach toward installation that came with unique learning curves. “We have found that with these pre-built pods, it takes a group



“One of my favorite parts is working with the team I’ve assembled from previous projects, a team I know can deliver on the citizenM standard for acoustical suppression and workmanship,” says Holmberg Mechanical’s HVAC Foreman, Arnie Barros. “One unique area for this job is the rooftop ductwork. It is double stacked and resting on large steel-frames (goal posts) that we designed so the duct becomes the screen wall for the rooftop mechanical equipment.”

There is another citizenM hotel in Seattle, so the project team has enjoyed visiting to compare and contrast the buildings, talk with citizenM staff on their favorite parts of the hotel, discover what can be improved, and gather other real-world applicable feedback.

“Not only was the pod design a fresh idea for all trades to undertake, but the citizenM Pioneer Square project was unique





SMACNA members perform work in industrial, commercial, institutional, and residential markets. They specialize in heating, ventilation and air conditioning, architectural sheet metal, industrial sheet metal, kitchen equipment, specialty stainless steel work, manufacturing, siding and decking, testing and balancing, service, and energy management and maintenance.

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effort from all trades,” he says. “It has been great working with Mortenson, Sequoyah, Goebel, PCI, and all of the citizenM team to achieve the desired guestroom look. We cannot wait to see the finished product.”

Speaking again to the tight ceiling space, the Holmberg team needed to stress the importance of plumbing and HVAC detailing to make sure all trades fit within the tightest ceiling they have ever seen.

“Johnson Barrow had performed a mockup room to demonstrate to citizenM how quiet and efficient heating and cooling can be while maintaining such small ceiling space,” Johnson says. “The fan coil units in each room are 7 ½” tall. This was the best system that could be used that would take up the least amount of space.”

The 216 key hotel will span ten floors and cover 66,918 square feet. It is located on the site of Seattle’s first sawmill in now what is known as the city’s premier cultural and art district. Guests will enjoy close proximity to nightlife, Lumen Field for Seahawks games, T-Mobile Park to watch the Mariners, Pike Place Market, and the Waterfall Garden Park.

The project team includes Amsterdam-based company Concrete, which is behind the design. Gensler is the architecture firm, and Mortenson is the general contractor. citizenM Pioneer Square is scheduled to open in 2022. For more information about this hotel, visit [www.citizenm.com](http://www.citizenm.com). ■

*Angela White is the marketing and public relations manager for Holmberg Mechanical, a 72-year-old, design-build, full-service contractor located in Bellevue, WA. Holmberg Mechanical engineers and constructs large-scale commercial projects such as high rise, transportation, hospitals, hotels, and more. The company has made the Puget Sound Business Journal’s “Best Places to Work” list three years in a row, as well as Inc. Magazine’s “5,000 Fastest Growing Companies in America” list two years running. Learn more at [holmbergco.com](http://holmbergco.com).*



# TECHNICAL BULLETIN: INSULATION SPECIFICATION

## WHY NOT TO SPECIFY THE DENSITY OF THERMAL AND ACOUSTIC DUCT INSULATION USED IN HVAC DUCTWORK

*Courtesy of SMACNA National | [smacna.org](http://smacna.org)*

In sheet metal ducts, insulation is often an important component of the system. Fiberglass and closed cell foam insulations are commonly used for thermal insulation to reduce heat transfer, or acoustic insulation is used to reduce noise levels.

When used to reduce heat transfer, insulation can be saving energy and/or be preventing condensation. As a noise reduction medium, it can reduce the noise levels inside ductwork caused by the fan, generated from duct or components, or caused by noise breaking into the duct system from its surroundings. When specifying insulation, the design engineers should specify the performance parameters of importance, depending on if the insulation is for thermal control, noise reduction, or both.

### **Thermal Control**

Insulation is applied to ductwork to increase thermal resistance, reduce energy loss, and prevent condensation or dripping from the duct. Thermal insulation is often needed because air

transported through a supply duct is at a temperature different from that of the surrounding space where the duct is located. For example, the air inside the duct may be at 55°F while the temperature surrounding the duct could be between 70°F to 90°F or more in the space above the room, since ductwork most often runs through unconditioned spaces. Insulation reduces the rate of thermal loss or gain from those surroundings. The air may need extra heating or cooling to arrive at the design supply air temperature if the supply duct is uninsulated.

Insulation helps to prevent condensation and dripping from air-conditioned ducts, which very often transport air at temperatures below the external local dew point. In the absence of insulation and vapor barrier, water will condense and could cause corrosion and other damage.

### **R-Value**

The thermal resistance of insulation is determined by its R-value,

which is the resistance measured at a known temperature difference between the air inside the duct and air outside the duct. R-value accounts for all the heat transfer modes that take place in the air conduction systems. It depends on the insulation material, its thickness, and its density. For example, the thicker the material, the higher is its thermal resistance. However, while the thermal resistance of the insulating material is known, the overall thermal resistance between the air in the duct and the surrounding space also includes the internal and external film resistances, leading to a larger resistance than just the insulation resistance by itself.

Building codes specify the amount of insulation required for ducts in terms of resistance. For example, ASHRAE 90.1 and California Title 24 specify the minimum insulation R-value for supply and return ducts, considering both heating and cooling ducts. It could be up to an R-8.

**Thermal Conductivity: *k***

Laboratory tests are used to determine the thermal conductivity of an insulation. It basically represents how fast the heat is transferred at a given temperature difference. The R-value for just the insulation is calculated from:

$$R = \frac{t}{k}$$

where *t* is the thickness of the insulation in inches and *k* is the thermal conductivity of the insulation in units of Btu•in/(hr•ft<sup>2</sup>•°F). The relationship shows that the higher the thermal conductivity of an insulation material, the thicker it has to be to deliver the same thermal resistance.

Values of thermal conductivity are determined experimentally at a mean temperature of 75°F and typically range from 0.23 to 0.35 Btu•in/(hr•ft<sup>2</sup>•°F) in duct insulations. So for *t* = 1 inch, and *k* = 0.25

Btu•in/(hr•ft<sup>2</sup>•°F), the resistance *R* is:

$$R = (1 \text{ inch}) / (0.25 \text{ Btu} \cdot \frac{\text{in}}{\text{hr} \cdot \text{ft}^2 \cdot \text{°F}}) = 4 \frac{\text{hr} \cdot \text{ft}^2 \cdot \text{°F}}{\text{Btu}}$$

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The units are normally left off for R-values and the one for this would be an **R-4**.

The resistance equation can be rewritten to calculate the thickness required for a specified thermal conductivity:

$$t = kR$$

Using the same units, if an **R-8** is required and the thermal conductivity is *k* = 0.25 Btu•in/(hr•ft<sup>2</sup>•°F), then

$$t = 0.25 \times 8 = 2 \text{ inches}$$

So, the density is not what should be specified to meet an R-value; the thermal conductivity should be specified. Given the thermal conductivity the manufacturer or installing contractor will need to determine thickness needed to meet the R-value.

The thermal resistance of an insulation is a function of the insulation type, its thickness, and its composition. For example, the thermal conductivity of mineral wool is higher than that of fiberglass for the same density. A typical mistake in specifications is to specify the associated density or a thickness of the insulation, rather than the R-value or the thermal conductivity, *k*, and the thickness. Materials may have different densities, but they may have a similar thermal performance. Specifying an R-value can give the contractor options. They may be able to use a thinner material with a low thermal conductivity or may have to use a thicker insulation thickness to meet the R-value.

**Acoustic (Noise) Control**

Noise control is often the main reason to specify an insulation. Sound starts at a source that causes the air or material to also vibrate and create sound waves. Sound waves propagate in all directions. In an HVAC system sound propagates from the source (fan) to a receiver through many different paths as depicted in this figure:

Although there are many different sounds that a receiver (the human) may hear, usually the loudest sound is from the fan. Air movement through ducts also generates noise that travels down the sound path in the ductwork. The ductwork, both supply and return, is generally the main path for the sound (although, as you can see, there are other paths). Metal ducts are very good transmitters of sound. Without proper attenuation, these sounds can be unacceptable at the receiver.

Noise can be controlled at the source (use a quieter fan or sound enclosure), controlled along its path (use of insulation), or controlled at the receiver (ear plugs, masking). This paper focuses on using insulation to control noise levels.

**Insertion Loss, Noise Control in Ducts**

Sound has two major characteristics: loudness, measured in decibels; and pitch, measured as frequency or cycles per second. One might choose to use duct insulation, silencers



or a combination of the two to control the noise level. Each will have data on the sound attenuation (insertion loss) as a function of the frequency band where the noise is occurring. The designer should choose the method of controlling the sound as a function of its loudness and frequencies.

The designer has to determine if the chosen silencer or duct liner has the right insertion loss for the noise spectrum to reduce the sound power level to that needed at the location of the receiver. The industry has already established that density was not a major factor in measuring or determining the insertion loss of lined ductwork. Insertion loss is a function of size, insulation thickness and length. This is evidenced by the regression equations developed to calculate insertion loss of rectangular or round duct which do not include a factor for density. As shown in the *SMACNA HVAC Sound and Vibration Manual, First Edition*:

For rectangular duct, the insertion loss equation is:

$$IL = B(P/A)^C t^D L$$

Where:

the size factor is perimeter/area, P/A, 1/ft

t is the thickness, inches

L is the length, ft

B, C and D are regression coefficients from Table 5-4 of the *SMACNA Manual*.

For round duct, the insertion loss equation is similar:

$$IL = (A + B \times d + C \times d^2 + D \times d^3 + E \times t) \times L$$

Where:

the size factor is the diameter d, in

t is the thickness, in

L is the length, ft

A, B, C, D and E are regression coefficients from Table 5-8 of the *SMACNA Manual*.

Neither of these equations have a factor for density!

### What Designers Should Specify

Insulation density plays a minor role in both thermal and acoustic performances. However, density is not a performance parameter. For thermal control the designer should specify insulation properties that give them the desired result. For example, if the designer wants an R-6 value, then insulation should be specified with the thermal conductivity and thickness that will give them the R-6 value. In this case a thermal conductivity of  $k = 0.25 \text{ Btu}\cdot\text{in}/(\text{hr}\cdot\text{ft}^2\cdot\text{°F})$ , and 1.5-inch thickness will give  $R = t/k = 1.5/0.25 = R-6$ . Or if R-6 is specified, the designer

can calculate the thickness that should be specified from  $t = kR = 0.25 \times 6 = 1.5 \text{ inch}$ .

For noise control in the duct systems, the designer will need to determine if using a silencer or lined duct should be used. For a silencer, the designer should specify the required insertion loss and maximum pressure drop allowed. Nothing is required for density. The installer would need to match the insertion loss against manufacturer's data on their silencers. There are often several silencers that will meet the insertion loss and pressure drop specifications.

If the designer chooses duct liner to control the noise, they will need to determine how much liner in feet is required for 1-inch or 2-inch thickness for the duct dimensions given. The density will not be a factor and the designer should just require the duct liner to give the necessary insertion loss. Any manufacturer's standard insulation should give the necessary insertion loss if the acoustics are designed correctly.

If the insulation is necessary for both thermal and noise control, the designer should specify the insulation to take care of the thermal control necessary as the insertion loss will be about the same regardless of the insulation chosen.

### Summary

From a thermal perspective, it is critical to specify thermal conductivity and thickness or R-value to determine the performance of the insulation. Specification of density or thickness alone does not lead to a minimum thermal performance.

Similarly, the acoustic performance is not determined by density or thickness alone; the performance parameter is the insertion loss.

Designer specifications should be performance-based. Leave out the density as a specified requirement. ■

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## LOOKING TOWARD 2022 SESSION

On January 10, 2022, the Legislature will start a 60-day session. Whether it will be in-person or virtual or something in between is unknown at this time. Concerns about the pandemic will dictate the format. The most likely scenario is that committee hearings will be virtual and floor activity will be in person for legislators. But unless the pandemic conditions improve, it is doubtful that the public will be welcomed back into the buildings.

The 2022 legislative session will be a mix of new and old issues. There will be pressure to fine tune some of the laws passed in 2021, specifically the police reform laws and the long-term care insurance law. Confusion over when and how police can respond to different situations may lead to clarification in the current laws. There will be calls to repeal the long-term care insurance law that goes into effect January 1, 2022. Repeal is unlikely but moderating some of the requirements for use are likely. Efforts to reform the emergency powers law will once again be debated. The current declaration of emergency for the pandemic has exceeded 600 days with decisions being made largely by the Governor. Many legislators would like to give the Legislature more control.

Transportation funding may be a major topic in 2022. The last transportation funding package was passed in 2015. A new funding package would include some of the money from the 2021 Climate Commitment Act (the cap and invest law), a new gas tax, and some other transportation fees. It might also include some sales tax money from transportation related projects that currently goes to the general fund. However, passing new taxes, even for transportation, in an election year is difficult.

### Other issues in 2022

In 2018, the Legislature passed a law changing the way prevailing wages are calculated, relying on collective bargaining agreements (CBA) to set the prevailing wage rates instead of traditional surveys. The Associated General Contractors (AGC) filed a lawsuit challenging the new law arguing the law is unconstitutional because it delegates the decision on prevailing wage rates to non-governmental activities, namely collective bargaining. The Appeal Court agreed with AGC, and the issue will be heard by the state Supreme Court. We expect the building trades to propose a bill this coming session to fix the 2018 law that would still preserve the use of CBAs in setting prevailing wage rates.

Reducing the use of natural gas and propane in homes and businesses is a goal of many environmental groups that argue the reductions are necessary to combat climate change. There are proposals under consideration by the Building Code Council that would restrict some natural gas uses. There was legislation proposed in 2021 that would have curtailed the use of natural gas. There will be proposals in the 2022 session that impact the use of fossil-based fuels in the following ways:



By / Kathleen Collins,  
Government Relations Consultant

- Require net-zero building codes for construction of homes and buildings by 2030.
- Require natural gas utilities to develop and implement clean heat transition plans that change to alternative heating sources and use of renewable natural gas or renewable hydrogen.
- Expand the current Clean Building law to lower the threshold of covered buildings to commercial buildings of 10,000 square feet or more and change the program to use greenhouse gas emissions as a measurement of the energy use in the buildings.
- Allow publicly owned electric utilities like Seattle City Light to use rate payer money for incentives to convert from gas to electric.

We expect that Governor Inslee may make some or all of these proposals Governor request bills.

Senator Karen Keiser, Chair of Labor, Commerce and Tribal Affairs, will be proposing expansion of apprenticeships to include new career fields in non-traditional occupations, such as health care, education, technology, and hospitality. She wants to explore ways to use apprenticeship programs in combination with community college classes to provide associate degrees. Another part of her proposal is to improve financial support for apprentices taking community and technical college classes and do more to encourage participation at the high-school level. This is an expansive proposal that may need to discussion beyond the 2022 session.

If you have questions or comments, please contact the SMACNA office. ▪

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## EMPLOYEE TRAVEL TIME NOW COMPENSABLE

On September 21, 2021, the Court of Appeals of the State of Washington held in *Port of Tacoma v. Sacks*, that all out-of-town employee travel time is compensable under state law. In the case, the Department of Labor and Industries (“L&I”) issued a citation to the Port of Tacoma for wages owed to four employees following a work-related trip to China. While the employer compensated the employees for eight hours per day for travel to, from, and within China, it did not pay the employees for their time spent traveling. Subsequently, the employees filed wage claims with L&I seeking compensation for all time spent traveling including to and from the airport, all the time spent at the airport, and all flight time. The employer appealed this citation.

On appeal, the Washington Court of Appeals held that travel time for out-of-town travel constitutes “hours worked” under Washington law which therefore required compensation. In reaching their decision, the Court noted how great deference was owed to L&I’s interpretation of “hours worked” and that compensation was consistent with both the plain meaning of the regulation and Washington’s long-standing policy of protecting employees.

Moving forward, this case will result in significant changes for all businesses located in Washington State because now, all employee time spent traveling out of town is compensable under state law. While federal law does not require employers to pay hourly employees for their time spent traveling outside normal working hours so long as the employee was not working during their travel time, this case now requires Washington employers to compensate for all travel time regardless of whether the employee is working during their trip. Accordingly, all businesses with hourly workers in Washington must revise their travel policies to reflect this change to the law.



By / JP Dowdle

Any policy should provide clear language informing employees that they are entitled to compensation for all time spent traveling so long as the travel is for work related reasons. Employers should carefully track the time employees travel—including to and from the airport, time spent at the airport, and time spent flying—and compensate them accordingly. This could be accomplished by the employer asking the employee to independently track their travel time or calculate the likely travel time beforehand and adjust for any unforeseen circumstances (i.e., flight being delayed) when the employee returns. If you have questions about how or if this law change will affect your business, please contact Employer Solutions Law for advice. ■

*J.P. joined Employer Solutions Law in September 2021 as an Associate Attorney. He comes to the firm with a wide breadth of experience in employment litigation, personal injury law, insurance litigation, and business law. J.P. received his B.S. in Business from the Kelley School of Business at Indiana University in Bloomington, Indiana. He received his J.D. from the University of Washington School of Law. When not working at Employer Solutions Law, J.P. enjoys trail running in the greater Seattle area and playing with his Great Dane, Wallace.*

Submit your news, story, or photo idea



### CONTRACTORS AND SUPPLIERS

*SMJ-WW* is on the lookout for interesting HVAC, architectural sheet metal, testing & balancing, and industrial/specialty news and feature topics. If you have a great idea, notice an industry issue that needs addressing, or want to weigh in on a technical subject, we would love to hear from you.

We also need great pictures—current and historical—of people working in all aspects of the sheet metal industry. If you have something to share, please email it to our editor, Jessica Kirby, with a caption about what is going on in the photo.

Questions about how else to get involved in a future issue of *Sheet Metal Journal*? Reach out to [jessica.kirby@pointonemedia.com](mailto:jessica.kirby@pointonemedia.com) or 250.816.3671 and get the scoop.

## LIFE SAFETY DAMPER MAINTENANCE AND INSPECTION

Fire and smoke dampers are a proven and effective way to protect ductwork and wall openings and shafts. Once Underwriters Laboratories (UL) created Standard 555 for fire dampers, and Standard 555S for smoke dampers, the damper industry has worked closely with Building Code Authorities to design, manufacture and outline correct installation procedures.

Life safety dampers have evolved from black iron, single blade, gravity operated products to the actuated and dynamically operated products used today. As time progressed with it the test criteria has also become more stringent. In testing non-actuated fire dampers are required to complete 250 full open/close cycles. Actuated dampers are required to complete 20,000 open/close cycles. Minimum airflow ratings of 2000 fpm through the fully open damper and 4 inches of static pressure across the fully closed damper have also been established to eliminate marginal products from being installed. In addition, safety factor of 400 fpm and 0.5 inches of static pressure are used during the testing. A damper with the minimum 2000 fpm and 4" static pressure rating is tested at 2400 fpm and 4.5" static pressure.

Even with stringent test requirements, the proper performance of life safety dampers in the field requires that the manufacturer's instructions be followed. UL requires that installation instructions are provided with each package and now most have this information on line as well. Although installation requirements vary by damper manufacturer and model, the following items are generally covered in the installation instructions:

- The Wall /floor framing details
- Clearance requirements between the damper and the wall/floor opening
- Duct to damper sleeve connections
- How to properly secure the damper to the wall/floor opening

As with any mechanical device, PROPER MAINTENANCE is necessary to ensure that dampers will operate as designed and save lives. Inspection and maintenance requirements are by the individual manufacturers and by the National Fire Protection Association (NFPA). The most important step in making certain that a life safety damper will operate correctly is done during the COMMISSIONING process. Chapter 19 of NFPA Standard 80 states that "after the installation of the life safety damper is



By / Norm Grusnick, P.Eng.,  
Commercial Business Development Representative,  
ECCO Supply

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"After the initial commissioning process, it is essential to implement a periodic maintenance program for a building's life safety dampers."

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completed, an operational test shall be conducted." The standard goes on to state that for combination fire and smoke dampers "the operational test shall be conducted under non-fire HVAC conditions as well as static flow conditions." The National Building Code references NFPA for proper maintenance of life safety dampers.

After the initial commissioning process, it is essential to implement a periodic maintenance program for a building's life safety dampers. Chapter 19 of NFPA 80 including fire dampers states "Each damper shall be tested and inspected one year after installation. The test and inspection frequency shall then be every four years, except in hospitals, where the frequency shall be every six years."

Safety of our buildings and their occupants is of prime importance. The continued routine maintenance and documentation by the end user allows the systems to perform and function as designed and intended. ■



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## GET READY FOR MORE CHANGES IN OUR INDUSTRY

Since ancient times, civilized humankind has used air systems to improve lives. As early as 4,000 BCE, civilizations across the Middle East from Egypt to Persia built large buildings with “wind catchers”. These tall, chimney-like structures were built atop roofs with long vertical slots that captured the cooler nighttime winds and directed them down to underground basements to both cool the building’s occupants and help preserve perishable food. Our ancient ancestors understood the benefits of harnessing, directing, and controlling air systems, and if we fast-forward 6,000 years, we can see how our SMACNA national and local organizations have and will continue to promote the use of air systems to benefit our world today and into the future.

The Code and Technical Committee had a busy year in 2021. We finished our review of the 2018 Washington State Energy Code, which was finally adopted last February. Please see previous issues of this column in previous issues of Sheet Metal Journal-Western Washington for details on significant changes that might affect you. 2022 is looking even busier than 2021, with all kinds of changes to our industry. Some of the issues we will be addressing are outlined below.

SMACNA has revised the Duct Construction Standards Manual and has released the latest edition to include new fabrication tables for flat oval ductwork, updated hanger requirements, and standards for the use of spray and aerosolized duct sealants for duct installation. In addition, there is a new standard for lining round and spiral duct fittings. Coming out in 2022 will be a rectangular duct construction app to assist in selecting material gauges and reinforcing for a variety of pressure classes and duct sizes for both positive and negative pressure systems. Our committee will scrub this new edition and provide feedback in the coming months.

Next year, SMACNA will also be releasing updates to the Seismic Restraints Manual, the Round Industrial Duct Construction Manual, Fire and Smoke Damper updates, and a new Kitchen Equipment and Ventilation Manual, which includes new standards for kitchen exhaust duct fabrication and installation. A lot of new information coming our way that our committee will dig into to help you stay up to date.

SMACNA has also been busy recently publishing a series of new Technical Resource Bulletins (TRBs) on a variety of subjects. Some of these include detailed guidance on fabrication and installation of outdoor/rooftop ductwork systems, duct liner application updates, and updated guidance on the use of internal reinforcing tie-rods. These bulletins provide excellent, detailed guidance on very specific topics critical in our industry, and our committee will be reviewing the latest TRBs next year to



By / Peter Boileau, Chairperson  
SMACNA-Western Washington Code & Technical Committee



help educate and spread awareness to our members of these important details.

Despite the delay in adoption of the 2018 Washington State Energy Code due to COVID-19 impacts, the 2021 code updates are expected to stay on schedule, with adoption of the 2021 code anticipated in July 2023. The suggested amendments and changes from the state’s Technical Advisory Group (TAG) have just been released, and our committee will once again highlight and share these updates. As we have done in the past, we will clarify how they may impact your business.

And finally, we are rapidly moving closer to the implementation of the Washington State Clean Buildings Act. This standard focuses on reducing energy consumption in all new and existing commercial building over 50,000 square feet, and also in the “de-carbonization” of new and existing buildings now and in the future. The Clean Building Standard first appeared in 2016 in the form of the City of Seattle’s “Building Tune-ups” program, followed by passage of House Bill 1257 in 2019. This new law will be phased in over the next several years. It will require buildings to meet target “energy use index” (EUI) values for maximum allowed energy consumption and eliminate the use of carbon-based fuels (primarily natural gas) in favor of refrigeration cycle electric heat pump technology for heating, cooling, and domestic water generation.

This is a major change to the existing commercial building in our state because by the dates targeted, these buildings/owners

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## SAFETY BUY-IN STARTS WITH A SINGLE THOUGHT

Business development is the focus of most companies. Getting more customers, making more sales, upselling existing clients. Companies hone and adjust their marketing messages to attract more revenues. When more clients buy from us, there is cause for celebration.

Sometimes, what's being sold is a product, sometimes a service, sometimes an idea or point-of-view. But business doesn't develop until someone buys something.

### **In order to buy, someone needs to sell.**

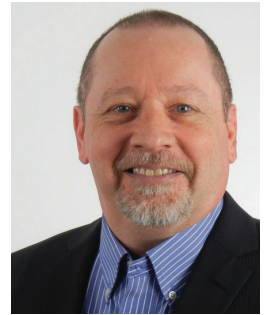
When you're a job seeker, you're selling yourself. Lawyers are selling to juries to keep their clients out of prison. When you go looking for a raise, you're selling your value and experience.

Even the consultants and self-proclaimed experts who try to dominate the LinkedIn discussions are trying (seemingly desperately) to sell their point-of-view. Unfortunately, cynicism, mockery, and ridicule are ineffective tools in getting others to buy-in.

However, when we try to get our employees to improve their safety performance, we are in effect, trying to get buy-in to our way of doing things. That is selling. Before someone will "buy" someone else has to "sell."

### **Internal marketing is key to safety buy-in.**

We are selling to our internal customers, our employees. This is internal marketing, and it is necessary to get buy-in to any goal, idea, or even the safety program.



By / Kevin Burns, [www.kevburns.com](http://www.kevburns.com)

Internal marketing is the best way to help employees make a powerful emotional connection to safety. Without that emotional connection, employees can undermine safety unconsciously.

In some cases, it is because they simply don't understand what it is that you want them to do, specifically. So, they end up working at cross-purposes. It may be that employees feel disengaged or even hostile toward their own company. Employees don't want to give their all to an employer who doesn't seem to value them or their contribution.

However, when employees believe in the mission and they buy-in to the plan to achieve that mission, they're more motivated to work harder and their loyalty to the company increases. Employees become more unified and inspired by a common sense of purpose and identity.

### **Create a unified vision for safety.**

An organization that doesn't understand internal marketing is going to struggle to get employees unified around a common theme based on safety. Oh, there is certainly a need to keep people informed about the company's safety strategy and direction, but very few organizations understand the need to convince employees of why safety is necessary to achieve the employees' own goals.

What's more, the people who are charged with internal safety communications, like the safety and HR departments, and even the front-line supervisors, don't have the marketing skills to communicate it successfully. Instead, PowerPoint slides, bar graphs and charts, and lots of talk about numbers are the tools of choice. Ineffective tools that are not designed to convince employees of the uniqueness of the company's safety strategy. The intent usually is to tell people what the company is doing, not to sell them on getting behind the idea.

There needs to be a vision for safety, a unifying idea that employees can "live" in their day-to-day activities. And when employees live that vision, they are much more likely to experience their own participation in safety in a way that's consistent with working toward the vision and goals of safety.

### **The safety mission in a single phrase.**

The first step of getting any kind of employee buy-in to the safety program is to get rid of distraction and superfluous numbers

**EDITORIAL COMMENT**

continued from page 4

Whether dealing with personal, professional, or even recreational development and productivity, consider peer groups as an excellent resource. Growing a valuable network is hands down the best way to get new insight, share and receive constructive feedback and direction, and become a more robust and productive presence in your industry. What are you waiting for? ■

**CODE CORNER**

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need to both reduce their energy consumption and switch from fossil fuels to electric/heat pump systems. The target dates in this law are 2026 for all buildings over 220,000 square feet, 2027 for buildings over 90,000 square feet, and 2028 for all buildings over 50,000 square feet. Buildings that meet these goals prior to the dates above will be eligible for incentives, and those that do not comply by these dates will be subject to fines. In order to obtain at least some financial relief from these requirements via the incentives offered, we need to inform our customers and help them strategize the least-cost approach to this legislation. The code and technical committee is a resource for you to use to develop these strategies, so please reach out as needed and we will assist with this complex issue.

And as always, our committee will continue to promote air-side solutions as the best method to achieve safe, cost effective, and energy efficient solutions for our customers. Our industry

is already based on the use of almost 90% recycled content in the sheet metal systems we install, providing enhanced environmental benefits and reducing the carbon footprint of every building we touch. ■

**SAFETY**

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assaults. Can you boil down your safety purpose and vision to a single phrase? If you can't, then you're going to struggle with buy-in from your team.

It is imperative that every good communications strategy must revolve around a single idea. That idea needs to become the foundation of how all communication is structured.

That foundational statement needs to be seven words or less. And yes, every organization that I have taken through this exercise has successfully reduced their foundational safety statement to seven or fewer words. And they have felt more powerful and focused as a result.

It is a process that works. No more will you struggle with throwing a bunch of mixed messages out there and hoping something sticks. This is a plan to focus your safety communications on a single foundational idea. And then everything you say after will support that statement.

If you want to get employee buy-in to safety, the best way to start is with a single foundational statement. The RYT Program is where you start. Check it out: [kevburns.com/marketing-for-employee-buy-in](http://kevburns.com/marketing-for-employee-buy-in) ■



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