

## For Immediate Release

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### CASE STUDY: THE MAYO HOTEL IN TULSA, OKLAHOMA

## Flexible PEX-a Plumbing Proves Ideal Choice For \$40 Million Makeover of Historic Mayo Hotel

Historical renovations can present major challenges, as installers strive to preserve the original look of these older structures while staying within budget. That's why Palmer Mechanical opted for flexible PEX-a piping over copper for the new plumbing and heating systems at The Mayo Hotel in Tulsa, saving 30% in installation costs.

BY JASON DRAKE

**TULSA, OKLAHOMA** – Historical buildings restored to their original look and feel can be awe-inspiring on the outside and exquisite within. But getting to that ultimate state of renewed grandeur, while meeting all the codes and regulations that apply to this special type of construction project, can involve numerous challenges for building designers and installers. Nowhere are these complexities more acute than in the modern mechanical systems that must somehow fit within the confines of structures made long ago to accommodate something far simpler and smaller.

"There are lots of hoops and hurdles the owner of a historical building must jump through during the renovation process," says Todd Ringgold of Palmer Mechanical, a Tulsa-based contractor that has made historical renovations a major part of its



**The Mayo Hotel in Tulsa:  
Its grandeur fully restored.**

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business in recent years. High ceilings — “at least as high as the original building, if not higher,” he says — and plaster walls are musts, of course. But while the interiors harken back to an earlier era, all the amenities must be thoroughly modern and efficient, to better attract buyers and tenants. As a consequence, the updates typically include larger bath and kitchen facilities, equipped with the latest conveniences.

Proper performance of those amenities demands an equally modern infrastructure, none of which can be all that visible nor take up much space, lest they detract from the authenticity of the restoration. The updated wiring, ductwork, conduit and piping for the communications, HVAC, electrical and plumbing systems usually must fit snug-tight into the available air space between the floors of these buildings. Says Ringgold, “Essentially, we must squeeze a lot of piping into a very small chase.”



**Todd Ringgold of Palmer Mechanical checks out a domestic cold-water header on one of the floors at the Mayo Hotel. “We could re-pipe the building at a faster pace [with PEX] than the rest of the trades could renovate the rooms.”**

The Palmer Mechanical portfolio contains five historical renovations in Tulsa over the past decade, including Philtower Building, the former Tulsa City Hall (now being converted into a hotel) and — perhaps the most notable of all — the landmark, \$40 million Mayo Hotel project, completed in 2009. All were design-build projects that allowed Palmer to do its own system design work, to better match the infrastructure to the radically altered configurations of these buildings after they had been completely gutted.

“In the restored buildings, the newly enlarged bathrooms and kitchens don’t line up from one floor to the next as neatly as they did in the older structures with their simple, tub-sink-toilet layouts,” says Ringgold, who has served as Palmer’s project manager on each of these jobs. “That’s because the new bathrooms usually include large, marble-and-tile showers with whirlpool tubs, marble-topped vanities, and bigger closets.”

And while carving out additional space for larger, better-appointed bathrooms, Ringgold and his crews still must leave enough room for equally well-appointed kitchens, living areas, bedrooms and as so forth. As a result, he says, "The piping, wiring, venting and so forth have to be completely redone."

**PEX-a flexibility:** The design-build process gave Palmer Mechanical another advantage: more decision-making authority over the types of building materials used on the project. This has enabled the company to use a different type of plumbing system: crosslinked polyethylene, or PEX-a, pipe rather than copper.

PEX-a's flexibility and ease of use is a major laborsaving, stress-reducing improvement over the rigid copper and rigid plastic systems of the past. Just as the inherent characteristics of copper led to its replacing old-fashioned galvanized steel and cast iron in years past, the significant benefits of flexible PEX-a have made it not only the preferred choice for commercial applications in general, but also the ideal solution for meeting the demands of historical renovation.

Using the "Engel" manufacturing method, which results in a very high degree of molecular crosslinking, PEX-a offers exceptional durability and flexibility. That flexibility, combined with the availability of PEX-a in long coils, eliminates many of the fittings and connections required in rigid metal and plastic plumbing systems. Eliminating fittings means less material, less installation labor and fewer potential leak points, all of which results in more efficient installs and lower costs.

Ringgold happily put these advantages to work in all of the renovation jobs he managed for Palmer Mechanical in recent years. His own first encounter with PEX-a came eight years ago at the behest of the new owner of a hotel in downtown Tulsa. Re-piping that building's entire plumbing system with PEX-a, Ringgold estimated his labor costs were half what they would have been had he replaced copper with copper.

"Once we got on the project, we discovered we could re-pipe the building at a faster pace than the rest of the trades could renovate the rooms," he recalls. "By the end of the project, I was a true believer."

With their special demands and limited space, the subsequent renovation projects he managed for Palmer only strengthened this conviction. Ringgold had previously done plumbing-service work in many of these projects, so he was familiar with their

peculiarities and understood how a full-fledged, gut renovation with a sharp eye on history would only lead to bigger construction hurdles.

**Exhibit A: The Mayo:** The most impressive example is The Mayo, also located in downtown Tulsa. Built in 1925 by the brothers Cass A. and John D. Mayo, the original 18-story tower housed 600 guest rooms — each with its own ceiling fan, a major selling point — and served as a gathering place for Tulsa high society and visiting dignitaries and celebrities. (Oilman J. Paul Getty once made The Mayo his full-time home.)

In 1980, the venerable hotel achieved recognition on the National Register of Historic Places, even as it struggled to regain its fading, grand-hotel luster. Following the last of several botched attempts at restoration, The Mayo sat idle for nearly two decades until 2001, when it was bought for \$250,000 by the Snyder family, whose vision was to restore its special character and former glory. The final result is now an elegant mix of hospitality and residential spaces, with 102 hotel rooms and 70 apartments, ranging from 450 to 1,200 square feet and offering views of the nearby Arkansas River, the BOK Center and downtown Tulsa.



In its own way, The Mayo's refurbished infrastructure is as impressive as its restored interiors and exterior. Galvanized steel mains deliver cold water to each floor of the hotel, with the run-outs to the living spaces made of Uponor AquaPEX® PEX-a pipe, furnished by Uponor North America. Each residential space has its own water heater, while hot water for hydronic space heating is delivered by one of the boilers located in a basement mechanical room. This setup entails two piping systems on each floor — domestic hot water and space heating — each also made of PEX-a and running from each residential unit to one of two nearby mechanical rooms on each level.

**Inside the Mayo Hotel in Tulsa: Todd Ringgold of Palmer Mechanical with hotel owner Macy Snyder Amatucci, who also serves as director of sales at The Mayo.**

“We installed about 70,000 feet of AquaPEX for the plumbing system and another 51,000 feet of Wirsbo hePEX for the hydronic heating and cooling runs,” reports Ringgold, who led a 20- to 25-man crew during an installation process that spanned approximately five months. It is important to note that the heating and cooling piping, Wirsbo hePEX™ (also manufactured by Uponor North America), features a special oxygen barrier to protect ferrous components in the system from corroding through contact with oxygen in the water.

All this piping — nearly 23 miles worth! — had to be stacked or racked with the electrical, fire sprinkler, venting and communications lines in chases concealed above the hallways inside the nine-foot-high ceilings on each floor. The dimensions of these overhead chases, Ringgold estimates, were only “three or four feet wide and four or five inches in depth” — hardly big enough for a grown man to crawl through, let alone one charged with the task of making leak-free pipe connections.

“That’s where PEX-a really comes into play for us,” says Ringgold. Installing long straight runs of PEX-a pipe of up to 140 feet within these cramped quarters was challenge enough. But, thankfully, no pipe connections were needed with PEX-a, which comes in coils up to 1,000 feet in length. This is in sharp contrast to using straight lengths of copper, which would have required soldering a pipe joint every 20 feet.

“Shoehorning an installer into those little spaces with a torch would’ve been just

## Project Profile

### Location:

Tulsa, Oklahoma

### Application:

\$40 million hotel renovation, including new plumbing and heating systems; completed in 2011

### Featured Systems:

Uponor AquaPEX Plumbing System and the Wirsbo hePEX Distribution Piping, as well as ProPEX® fitting system

### System Details:

Roughly 121,000 feet of tubing:

- Uponor AquaPEX® (plumbing): Wirsbo hePEX™ — 30,000 feet of 1/2-inch, 28,000 feet of 3/4-inch and 12,000 feet of 1-inch
- Wirsbo hePEX™ (heating): 8,000 feet of 1/2-inch, 36,000 feet of 3/4-inch; 6,000 feet of 1-inch and 1,000 feet of 1-1/2 inch.

### Building History:

Built in 1925, the original hotel was designed by George Winkler in the Chicago School vernacular developed by Louis Sullivan. The base of two-story Doric columns supports 14 floors marked with false terracotta balconies, and a two-story crown of stone and a dentiled cornice. Glamorous surrounding and advanced features — running ice water and ceiling fans in each room — made The Mayo a well-known local hangout for celebrity entertainers like Bob Hope, Mae West and Will Rogers.

Six renovation attempts failed before the current owners, the Snyder family, purchased the property in 2001 for \$250,000 and successfully completed a refurbishment that restored its original look while delivering modern amenities to residents and guests — all while maintaining its place on the National Register of Historic Places. “We did not buy this building planning on doing any of this with it,” says owner Macy Snyder Amatucci, director of sales at The Mayo. “That wasn’t the plan — that was a dream, but a very farfetched dream. We’ve come a long way.”

### Installer:

Palmer Mechanical (Tulsa)

asking for trouble. Why mess with fire in tight spaces, especially one with hard, plasterboard ceilings?" asks Ringgold, who figures that using time-consuming copper would have boosted installation costs by as much as 30 percent.

"You could hardly afford to do the job with copper, with all the fittings you would need for your offsets," he continues, noting that more connections, by definition, equals a greater potential for leaks.

**Other PEX-a benefits:** The special characteristics of PEX-a pipe also deliver other time- and money-saving advantages in a large and complex renovation project such as The Mayo.

- *Bend – don't break:* Ringgold recalls one especially difficult part of the installation in which the layout called for routing plumbing lines through an attic area above the hotel ballroom. This space was "jammed with electrical gear," he says, so his crews needed to circle the lines around this equipment. With copper, every change in direction necessitates cutting the pipe and soldering two connections. With PEX-a, which has the smallest bend radius of any type of PEX, it's simply a matter of bending the pipe in the desired direction. In this instance at The Mayo, the ease-of-use advantage had benefits beyond speed, given the precarious location of the attic above a set of stairs.

"Instead of trying to sweat copper connections while perched 25 to 30 feet in the air over a stairwell," he says, "we were able to maneuver a continuous length of PEX-a pipe through the hangers in much less time and with less hazard and cost."

- *Swift, sure connections:* In places where pipe joints are unavoidable, making them is relatively easy when you capitalize on the natural ability of PEX-a to expand and contract, using an "ASTM F1960 cold-expansion connection." One of the simplest, strongest and most reliable connections available, it requires four simple steps:

1. Cut the pipe with a plastic pipe cutter.
2. Place a PEX-a expansion ring on the end of the pipe.
3. Expand the pipe and the ring with a Milwaukee® ProPEX® M12™ or M18™ Expansion Tool.
4. Insert the larger-diameter fitting.

The pipe and ring will then immediately and naturally begin contracting back to their original shape, compressing tightly against the primary and secondary fitting barbs with up to 1,000 pounds of radial force. Meanwhile, there's no deburring, no torches, no flux, no solder, no cements and no curing or cooling time.

The resulting permanent connection holds tight in tests up to 1,000 pounds of pull force. In addition, since the pipe is expanded before the fitting is inserted, it's impossible to "dry-fit" the connection, eliminating the possibility of incomplete fittings and the resulting blow-off leaks. As Ringgold notes, "The flexibility of PEX-a gave us not only much more maneuverability for the install, but also far fewer chances for problems, post-installation."

- *Superior heat retention:* The Mayo project was Palmer Mechanical's first experience using PEX-a pipe for heating and cooling lines, and Ringgold was impressed by the fact that his crews did not need to insulate the pipe. Not only does PEX-a resist condensation on cold-water lines better than copper, but it also offers superior heat retention in hot-water supply runs. At The Mayo, the system-temperature levels were such that no insulation was needed. "That saved a lot of installation time as well," says Ringgold.

**Words of wisdom:** What advice does Todd Ringgold have for his fellow plumbing and mechanical contractors looking to tackle a large, historical renovation?

First and foremost, *familiarize yourself with all the relevant rules and regulations*, he says. A smart contractor will become thoroughly familiar with what the authorities will and will not allow, and then plan the project accordingly, down to even minor details. On occasion, these rules may seem to border on pure fussiness, but that doesn't mean a contractor will have much luck arguing his way free of them.

"At The Mayo, for example, they told us exactly where we could position cleanouts — and the hallways were definitely off-limits!" Ringgold comments. "They also specified the paint color for the windows. Sounds like small stuff, I know. But that's how seriously they take the issue of historical authenticity. There were no cleanouts in the hallways of the original structure, so there mustn't be any in the renovated building, either."

This first bit of advice leads directly to Ringgold's second key point: *Leave yourself some "wiggle room" in your budgeting in the event of surprises.* In fact, a contractor

can pretty well count on more than one close encounter with the entirely unexpected. That comes with the territory when doing historical renovations, warns Ringgold.

“You don’t know what you’re up against until you start opening up the building. Then it may be too late.”

No wonder that Ringgold and Palmer Mechanical put such a high premium on flexibility in this type of work, which is why the company has come to believe that PEX-a is the way to go for plumbing and heating systems. Although Ringgold came to embrace PEX-a fairly quickly after his initial experience in 2005, he knows that some contractors, engineers and owners remain unpersuaded. Among those working with the tools, the biggest objection he has encountered has been an “aesthetic” complaint:

“They say it’s not as ‘pretty,’ once installed, as copper” — an objection that Ringgold finds bewildering when set against the economic arguments for PEX-a, including the comparatively high and rising cost of copper. That cost, in turn, makes it a prime target for jobsite theft.

Still, some of the trades remain skeptical of plastic in general for reasons beyond appearance. Many of these professionals hesitate because of their long, negative memories of polybutylene (PB) and the hardships failed PB systems caused builders and installers around the country in the early 1990s. But the problems of gone-but-not-forgotten PB have nothing to do with PEX-a, which was first commercialized in Europe in the 1970s and came to North America in 1984.

In response, Ringgold points to the length of the warranty for PEX-a versus copper: In Uponor’s case that protection extends 25 years on both the Uponor AquaPEX pipe and the ProPEX fittings when installed by a factory-trained professional. “What copper producer offers that kind of warranty?” he asks. “For me, it provides so much peace of mind.”

The most important assurance of all for Ringgold is the trouble-free performance of the systems Palmer Mechanical has installed over the past eight years. “We have seen no problems and no complaints with the PEX-a systems on any of these historical-renovation projects in Tulsa, including the very first one that served as our learning curve. Their system still runs like a top.



“That’s why — in my opinion — a contractor involved in a large commercial renovation project would be crazy not to use PEX-a.”

# # #

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**Hi-res versions of a photograph to accompany this release** are available for immediate download in .tif format by using this link: <http://uponor.oreilly-depalma.com/casestudies/mayo-hotel.shtml>.

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