

Heat & Frost Insulators & Signatory Contractors

**LMGT**

Labor Management Cooperative Trust

# Mechanical Insulation - The missing piece in Commercial and Industrial Efficiency

# Introductions

LMCT Interim Director **Rob Hall**

Local 5 Business Manager **Michael Patterson**

Local 16 Business Manager **Melvin Breshears**

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# Labor Management Cooperative Trust – Mechanical Insulation

[www.insulators.org/LMCT](http://www.insulators.org/LMCT)

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## What is the LMCT?

- Labor Management Cooperative Trust (LMCT)
- The LMCT promotes the heat and frost insulation industry and expands the opportunities for both the members from the International Association of Heat and Frost Insulators and Allied Workers and their Signatory Contractors.



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## What is Mechanical Insulation?

- Mechanical insulation involves the insulation and jacketing of mechanical systems and process piping and equipment.
- Commercial and Industrial
- Green Construction
  - *According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE), properly installed mechanical insulation provides long-term energy efficiency, emission reduction, cost savings and safety benefits.*

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# Mechanical Insulation Benefits

- Reducing energy costs
- *The National Insulation Association estimates that maintenance of insulation at industrial and commercial facilities can:*
  - *Save \$4.8 billion in energy costs per year*
  - *Avoid 43 million metric tons of carbon dioxide per year*
  - *Generate 89,000 jobs per year*
  - *Between 10% and 30% of mechanical insulation is either damaged or missing*

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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise



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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

## **5.6LF of 6in Pipe / or / 6in Steam Valve Example:**

Predicted annual energy savings = 6in SV × \$119.75/LF = \$670.60

Predicted annual emissions savings = 6in SV × 0.65 MT/year/LF = 3.64 metric tons



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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

## **Steam Valve Example:**

Predicted annual energy savings

500 valves x 5.6LF x \$119.75/LF  
= **\$335,300 in annual savings**

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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

## Steam Valve Example:

Predicted annual emissions savings

500 valves x 5.6LF × 0.65 MT/year/LF  
= **1,820MT in annual emissions savings**

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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

**The average school has about 5 miles of piping.**

**The average hospital has about 8 miles of piping.**

**The average office building varies between the insulated piping size of a school and a hospital.**

**Heat distribution piping system example:**



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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise



**Heat distribution piping system** carrying hot water, at 180°F (82°C), from equipment that operates only half (4,380 hours) per year.

Predicted annual energy savings = 4.05 LF × \$15.08/LF = \$61 per year

Predicted annual emissions reduction = 4.05 LF × (0.09) MT/yr/LF = 0.36 metric tons

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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

**Heat distribution piping system example, predicted annual energy savings assuming each building is missing 10% of mechanical insulation:**

**5 miles of piping in a school x 10% x \$61/year / 4 In ft = \$40,260 in annual savings**

**8 miles of piping in a hospital x 10% x \$61/year / 4 In ft = \$64,477 in annual savings**



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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise



**Heat distribution piping system example, predicted annual emissions reduction**

5 miles of piping in a school x 10% x 4.05 LF × (0.09)  
MT/yr/LF = **950.4 MT in annual emissions savings**

8 miles of piping in a hospital x 10% x 4.05 LF × (0.09)  
MT/yr/LF = **1,520.64 MT in annual emissions savings**

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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

## **Mechanical Insulated Duct**

School, Hospital and Solar Power Application

Hospitals ave. 410,000 square feet of insulated supply duct with 0.52 square ft of surface area per square ft of floor area

And insulated return-air ductwork averages 0.15 square foot of surface area per square foot of floor area.

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# Mechanical Insulation Benefits

- **Solar and Renewable Energy**





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# Mechanical Insulation Benefits

- **Solar and Renewable Energy**



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# Mechanical Insulation Benefits

- **Solar and Renewable Energy**



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## Insulators Union

- Started in 1903
- Over 23,000 members
- Covers every county and every state in the United States
  - Local Workforce
  - Economic Impact
  - Skilled and Trained Workforce
- Trains (and pays for) the workforce



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# Training and Apprenticeships

- Registered Apprenticeship Programs
- Spend \$15m annually on workforce training
- Part of the Building Trades (spends \$1.3b annually)
- All of the Contractors and Insulators are trained with the proper safety protocols for every job. We work with industry and job-specific training to ensure all work is performed under all safety requirements.
- All of our Members and Contractors work under the Professional Craftsman Code of Conduct to ensure the job is built on time, under budget and built right the first time.



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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise
- Enhancing performance of mechanical systems
- Maximizing Return on Investment
  - Typical ROI is less than 6 months
- Preventing condensation & development of mold
- Providing safety and personnel protection
- Improving appearance
- Increasing life expectancy of new mechanical equipment



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# Mechanical Insulation Benefits

- Reducing energy costs
- Reducing emissions and noise

## **Case Study:**

**Goodyear tire plant: DOE assessment**

**Install and repair insulation on tire presses**

**resulting in:**

- Annual energy savings of 23,000 MMBtu of natural gas
- 224,000 gallons of No. 6 fuel oil
- Cost savings of \$385,000

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# Partnership opportunities

- Workforce development
- Include Mechanical Insulation in energy audits
- Encourage organizations to include Mechanical Insulation in Energy Services Performance Contracts
  - Municipal
  - Universities/Schools
  - Hospitals
  - Office Buildings
- Industrial efficiency programs



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**Thank you!**

**Any Questions?**



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## Contact

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# Building Energy Codes

- Department of Energy  
Energy Efficiency & Renewable Energy
- Building Technologies Program
- ANSI/ASHRAE/IES Standard 90.1-2010 & 2012 IECC
- Insulation Requirements in Commercial Buildings for Mechanical and Service Hot-Water Piping
- Get the entire document at [www.Insulators.org/LMCT](http://www.Insulators.org/LMCT)
- [ASHRAE Summary and Standards Charts](#)



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# School Buildings

- Benefits of Mechanical Insulation in school buildings
  - Conserve Energy
  - Energy Cost Savings
  - Safe Environment (firestopping)
  - Healthier Environment (mold)
  - Prolongs life of Mechanical Systems
- [Video](#)



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# Value Engineering

**“Value Engineering” = a studied approach to reducing building costs without compromising quality**

**This often entails comparing a range of construction methods and materials to determine the most cost-effective means of obtaining a desired structural, aesthetic, or durability standard.**

**But when it comes to insulation, the analysis needs to work in the opposite direction. The process is almost never done with the long-term ramifications of building operation in mind. Because in many situations, real “value engineering” could mean increasing the insulation thickness to offer the owner reduced cost to operate a building, along with a reduced carbon footprint and decreased greenhouse gas emissions.**

**The problem with value engineering mechanical insulation is that the cost to operate the building will increase as mechanical insulation is eliminated or reduced. When mechanical insulation is reduced, the equipment within a facility works harder, thus increasing operating costs and decreasing the life of the equipment.**

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# Value Engineering

**“Value Engineering” = a studied approach to reducing building costs without compromising quality**

**Removing mechanical insulation from a new construction project may cost the owner many thousands, if not millions, of dollars over the life of the building. By not investing in insulation up front, an owner may end up paying more.**

**Usually, insulation is thought of as an added expense. Instead, it should be viewed as an investment, as ROI for properly installed mechanical insulation is dramatic, often times accomplished in as little as a year.**