

Energy Tips

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Steam



Motors



Compressed Air

Availability

Insulation supply companies are located regionally to expedite delivery and to meet site-specific job requirements. Most supply companies can take measurements on-site to ensure the best fit on irregular surfaces. For customized applications, manufacturers can provide instructions regarding the installation and removal of insulating pads.

Noise Control Benefits

Specify insulating pads that contain built-in barriers for noise control.

Insulation for Steam Traps

Effectively insulate inverted bucket traps with removable and reusable snap-on insulation. Thermostatic and disk traps should be insulated according to manufacturers' recommendations to ensure proper operation.

Caution

Before removal of all or any insulation, a check for asbestos should be done in accordance with OSHA regulations.

Steam Tip Sheet information adapted from material provided by the Industrial Energy Extension Service of Georgia Tech and reviewed by the DOE BestPractices Steam Technical Subcommittee. For additional information on steam system efficiency measures, contact the OIT Clearinghouse at (800) 862-2086.



Install Removable Insulation on Uninsulated Valves and Fittings

During maintenance, insulation over pipes, valves, and fittings is often damaged or removed and not replaced. Uninsulated pipes, valves, and fittings can be safety hazards and sources of heat loss. Removable and reusable insulating pads are available to cover almost any surface. The pads are made of a non-combustible inside cover, insulation material, and a non-combustible outside cover that is tear- and abrasion-resistant. Materials used in the pads are oil- and water-resistant and can be designed for temperatures up to 1600°F. The pads are held in place by wire laced through grommets or by using straps and buckles.

Applications

Reusable insulating pads are commonly used in industrial facilities for flanges, valves, expansion joints, heat exchangers, pumps, turbines, tanks, and other irregular surfaces. The pads are flexible and vibration resistant and can be used with equipment that is horizontally or vertically mounted or difficult to access. Any high-temperature piping or equipment should be insulated to reduce heat loss, reduce emissions, and improve safety. As a rule of thumb, any surface over 120°F should be insulated for protection of personnel. Insulating pads can be easily removed for periodic inspection or maintenance and replaced as needed. Insulating pads can also contain built-in acoustical barriers for noise control.

Energy Savings

The table below summarizes energy savings due to the use of insulating valve covers for a range of valve sizes and operating temperatures.

Energy Savings (Btu/hr) from Using Removable Insulated Valve Covers^{a,b}

Operating Temperature, °F	Valve Size, inches					
	3	4	6	8	10	12
200	1,690	2,020	3,020	4,030	4,790	6,050
300	3,630	4,340	6,500	8,670	10,300	13,010
400	6,260	7,470	11,210	14,940	17,750	22,420
500	9,700	11,680	17,375	23,170	27,510	34,750
600	14,150	16,900	25,340	33,790	40,130	50,690

^a Based on 2-inches of insulation on 150 pound class flanged valves with an ambient temperature of 65°F.

^b From a personal communication and with permission from E.J. Bartells Co.

Example

Using the table above, calculate the annual fuel and dollar savings from a 2-inch thick insulating pad installed on an uninsulated 6-inch gate valve in a 250 psig saturated steam line (406°F). Assume continuous operation with natural gas at a boiler efficiency of 80% and a fuel price of \$3.00 per million Btu.

$$\text{Annual Fuel Savings} = 11,210 \text{ Btu/hr} \times 8760 \text{ hours} \times 1/0.80 = 122.75 \text{ MMBtu}$$

$$\text{Annual Dollar Savings} = 122.75 \text{ MMBtu} \times \$3.00/\text{MMBtu} = \$368 \text{ per 6-inch gate valve}$$

Suggested Actions

- Conduct a survey of your steam distribution system to identify locations where removable and reusable insulation covers can be used.
- Use removable insulation on components requiring periodic inspections or repair.

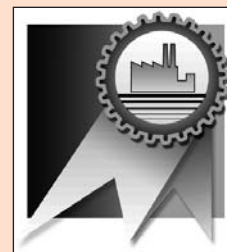
About DOE's Office of Industrial Technologies

The Office of Industrial Technologies (OIT), through partnerships with industry, government, and non-governmental organizations, develops and delivers advanced energy efficiency, renewable energy, and pollution prevention technologies for industrial applications. OIT is part of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.

OIT encourages industry-wide efforts to boost resource productivity through a strategy called Industries of the Future (IOF). IOF focuses on the following nine energy- and resource-intensive industries:

- Agriculture
- Aluminum
- Chemicals
- Forest Products
- Glass
- Metal Casting
- Mining
- Petroleum
- Steel

OIT and its BestPractices program offer a wide variety of resources to industrial partners that cover motor, steam, compressed air, and process heating systems. For example, BestPractices software can help you decide whether to replace or rewind motors (MotorMaster+), assess the efficiency of pumping systems (PSAT), compressed air systems (AirMaster+), steam systems (Steam Scoping Tool), or determine optimal insulation thickness for pipes and pressure vessels (3E Plus). Training is available to help you or your staff learn how to use these software programs and learn more about industrial systems. Workshops are held around the country on topics such as "Capturing the Value of Steam Efficiency," "Fundamentals and Advanced Management of Compressed Air Systems," and "Motor System Management." Available technical publications range from case studies and tip sheets to sourcebooks and market assessments. The *Energy Matters* newsletter, for example, provides timely articles and information on comprehensive energy systems for industry. You can access these resources and more by visiting the BestPractices Web site at www.oit.doe.gov/bestpractices or by contacting the OIT Clearinghouse at 800-862-2086 or via email at clearinghouse@ee.doe.gov.



BestPractices is part of the Office of Industrial Technologies' (OIT's) Industries of the Future strategy, which helps the country's most energy-intensive industries improve their competitiveness. BestPractices brings together the best-available and emerging technologies and practices to help companies begin improving energy efficiency, environmental performance, and productivity right now.

BestPractices emphasizes plant systems, where significant efficiency improvements and savings can be achieved. Industry gains easy access to near-term and long-term solutions for improving the performance of motor, steam, compressed air, and process heating systems. In addition, the Industrial Assessment Centers provide comprehensive industrial energy evaluations to small and medium-size manufacturers.

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