



Availability

Insulation supply companies are located regionally; this expedites delivery and helps 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 traps and disk traps should be insulated according to manufacturers' specifications to ensure proper operation.

Before removal of all or any existing insulation material, check for asbestos in accordance with OSHA regulations.

Steam Tip Sheet information adapted from information 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 EERE Information Center at 877-337-3463.

Install Removable Insulation on Valves and Fittings

During maintenance, the insulation that covers pipes, valves, and fittings is often damaged or removed and not replaced. Pipes, valves, and fittings that are not insulated 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 noncombustible inside cover, insulation material, and a noncombustible outside cover that resists tears and abrasion. Material used in the pads resists oil and water and has been designed for temperatures of up to 1600°F. Wire laced through grommets or straps with buckles hold the pads in place.

Applications

Reusable insulating pads are commonly used in industrial facilities for insulating 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 that is difficult to access. Any high-temperature piping or equipment should be insulated to reduce heat loss, reduce emissions, and improve safety. As a general rule, any surface that reaches temperatures greater than 120°F should be insulated to protect 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 to help control noise.

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. These values were calculated using a computer program that meets the requirements of *ASTM C 680—Heat Loss and Surface Temperature Calculations*. The energy savings is defined as the difference in heat loss between the uninsulated valve and the insulated valve operating at the same temperature.

Energy Savings ^a from Installing Removable Insulated Valve Covers (Btu/hour)						
Operating Temperature, °F	Valve Size (inches)					
	3	4	6	8	10	12
200	800	1,090	1,560	2,200	2,900	3,300
300	1,710	2,300	3,300	4,800	6,200	7,200
400	2,900	3,400	5,800	8,300	10,800	12,500
500	4,500	6,200	9,000	13,000	16,900	19,700
600	6,700	9,100	13,300	19,200	25,200	29,300

^a Based on installation of a 1-inch thick insulating pad on an ANSI 150-pound class flanged valve with an ambient temperature of 65°F and zero wind speed.

Example

Using the table above, calculate the annual fuel and dollar savings from installing a 1-inch thick insulating pad on an uninsulated 6-inch gate valve in a 250 pounds per square inch gauge (psig) saturated steam line (406°F). Assume continuous operation with natural gas at a boiler efficiency of 80% and a fuel price of \$4.50 per million British thermal units (MMBtu).



Results:

Annual Fuel Savings = 5,992 Btu/hr x 8,760 hours/year x 1/0.80
= 65.6 MMBtu/year

Annual Dollar Savings = 65.6 MMBtu/year x \$4.50/MMBtu
= \$295 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 Industrial Technologies Program

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

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

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

The Industrial Technologies Program and its BestPractices activities 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.eere.energy.gov/industry/bestpractices or by contacting the EERE Information Center at 877-337-3463 or via email at eereic@ee.doe.gov.

BestPractices is part of the Industrial Technologies Program Industries of the Future strategy, which helps the country's most energy-intensive industries improve their competitiveness. BestPractices brings together emerging technologies and best energy-management 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.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

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