

### Energy Efficiency & Productivity Case Study: Insulation of Steam Pipelines Comfit Composite Knit Ltd.

This series showcases success stories of PaCT (Partnership for Cleaner Textile) partner factories in the Bangladesh textile sector that have implemented cleaner production projects.

Uninsulated steam distribution lines are a constant source of wasted energy. Insulation can typically reduce energy losses by 90 percent and help ensure proper steam pressure for factory equipment. Any surface over 50°C should be insulated, including boiler surfaces, steam and condensate return pipings and fittings with valves. The heat loss from the uninsulated surface to the surroundings depends on the surface area and the difference in temperature between them. The higher the surface temperature, the higher the heat loss. To reduce surface temperature and energy consumption, proper insulation of the steam pipeline is required.

#### Insulation of the steam pipeline

Improper insulation leads to higher surface temperature and heat is lost throughout the uninsulated pipe, boiler surfaces, and valves through convective and radiative media. If the steam distribution network has uninsulated surfaces, more fuel is then consumed to compensate for the heat loss to provide the required quality (temperature and pressure) of steam. Hence, it is recommended to have proper insulation of the steam line to reduce fuel consumption. Heat loss from steam pipes depends on pipe sizes, insulation qualities, steam temperature (steam pressure) and surrounding temperature, which has been illustrated in Figure 1.

#### Benefits of Steam Pipe Insulation

- Cost Savings
- Increased Efficiency
- Energy Savings
- Safer Work Environment



#### **Factory Status**

Comfit Composite Knit Ltd. has three gas generators to provide electricity for the operation of various equipment. The gas generators are connected to an exhaust gas boiler (EGB), which recovers heat from the exhaust to produce steam for the pressing section.

The pipes and the EGB boiler were uninsulated and a surface temperature of more than 100° C was observed at the factory. PaCT suggested reducing fuel consumption by insulating the pipes and the boiler . It was also recommended that the uninsulated surfaces be properly insulated with insulation materials, such as glass wool with aluminum cladding, resin bonded rock wool, etc.

# Savings with proper insulation of the uninsulated steam surface

After proper insulation of the steam pipes and EGB boiler, the factory was able to save more than 8,000 NCM (normal cubic meter) of natural gas per year as well as an annual monetary saving of \$920.

## Figure 1: Heat loss in uninsulated pipe according to pipe diameter

Higher the steam temperature and pressure and larger the steam pipe diameter, greater the heat loss.

PaCT suggested that the factory conduct periodic inspection of steam pipelines to ensure proper condition of the insulation and thus, eliminate energy wastage.

