

Plastics: Industrial Assessment



Industrial Technologies Program

Assessment Date:
June 09, 2006

Benefits:

- Report identified potential annual energy cost savings of \$246K
- Plant found additional \$100K annual savings as a result of recommendation #1
- 8 of 10 recommendations implemented within 6 months, remainder budgeted for completion within 20 months

Applications:

The Texas A&M University assessment team for Texas Tile Manufacturing LLC discovered 10 opportunities to decrease energy usage and waste focusing on elements of the production process and the various energy streams, including natural gas, electricity, steam and the water usage of the plant. One important recommendation for the plant was the replacement of pilot lights with spark igniters, thereby reducing natural gas usage considerably. Once implemented by the plant they discovered the additional benefit of longer lives for their conveyor belts that were no longer exposed to heat from the pilots.

Vinyl Flooring Texas Tile Manufacturing LLC, Additional Savings are a Pleasant Surprise

Summary

Through the Department of Energy's Industrial Assessment Center at Texas A&M University, Texas Tile Manufacturing LLC, a vinyl floor tile manufacturer saved a significant amount of money from reductions in energy and water expenditures. Ten recommendations, all of which have been implemented, or are budgeted for implementation, will generate savings of over \$246,000/year. The implementation of one project by the plant also resulted in additional savings estimated at \$100,000/year.

Company Background

Texas Tile Manufacturing LLC produces vinyl composition floor tile for institutional and commercial applications. The raw materials are mixed and blended, formed into a large sheet, milled to the proper thickness, cut into tiles, then boxed and are made ready for shipment. During the process the vinyl sheet is heated by natural gas fired heaters to maintain pliability as it moves through the production process, and is then cooled prior to packaging.

Assessment Approach

A team consisting of 5 students and the Director and Assistant Director of the Industrial Assessment Center at Texas A&M University performed an assessment of this facility in the summer of 2006. After arriving onsite the team met with members of the plant energy committee, toured the facility, determined a number of potential conservation measures and gathered data in order to quantify the impact of the recommendations.

Energy Conservation Awareness

The IAC team documented many existing good practices by the plant. Included were their efforts to minimize and reduce waste of various raw material components, unnecessary lights being turned off, low NOx burners on the steam boiler, the existence of the energy management committee, lowered compressed air system pressure, and that the power factor was optimized at 99%. The IAC encourages the continuation of these practices and the implementation of the recommended projects



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“We implemented everything so far right to the ‘T’ like in your report... with what we did as a result of your report and some other things we’re doing we saved \$100,000 over the last two months, so the savings could be even more than what is in your report.”

Replace Pilot Lights with Spark Igniters

The vinyl sheet is kept pliable with gas fired heaters at various places in the production process, and the plant had been using pilot lights in these heaters. As sensors in the sheet path picked up the passage of a length of vinyl, they would turn on the flow of natural gas in the heaters, which would be ignited by the pilot lights. This practice burns a considerable amount of gas in the pilots that was wasted when vinyl sheet was not passing by in the production process. The IAC recommended the installation of spark igniters to replace the pilot lights and reduce this waste of natural gas. The recommendation was implemented by the plant personnel within six months of receiving the report. The original justification by the IAC determined that the natural gas conservation would save about \$113,000/year. Once the recommendation was implemented the plant personnel further noticed that the conveyor belts were lasting longer than they had previously, due to their not being exposed to the heat of the pilot lights when the vinyl sheet was not passing by on the belts. They have estimated the savings for this to be \$100,000/year.

Use Engineered Nozzles to Reduce Compressed Air Usage

Compressed air was being used to blow off dust from the product using open half-inch pipes, wasting a considerable amount of compressed air. Engineered nozzles, which entrain ambient air with a reduced compressed air input, can reduce this compressed air waste. Savings of over \$13,000/year are estimated.

Steam and Water Conservation Recommendations

Five recommendations dealt with minimizing steam and water usage. Condensate return, water leak repair, repairing steam traps and steam leaks, and improving insulation on one portion of the steam distribution system are estimated to save \$86,500/year.

Results

Within six months of receiving the report the Texas Tile Manufacturing LLC personnel had implemented eight of the ten recommendations. The remaining two recommendations are budgeted for implementation in 2007 and 2008. The total savings as documented by the IAC report and the Texas Tile Manufacturing LLC personnel are estimated to be \$346,000/year. Energy savings are 475,000 kWh/year, 20,000 MMBtu/year natural gas, demand of 500 kVA/mo/year. Water conservation totals 1,740,000 gallon/year.

Opportunities at Texas Tile Manufacturing LLC Houston Facility				
Recommended Action	Annual Resource Savings	Annual Cost Savings (\$)	Implementation Cost (\$)	Payback (months)
Install spark igniters	12,100 MMBtu	113,000 + 100,000	1,300	Less than 1
Return condensate	2,720 MMBtu	25,400	600	1
Insulate steam lines	2,298 MMBtu	21,460	6,120	4
Repair steam traps	2,260 MMBtu	21,100	1,235	1
HP sodium lamps	135,800 kWh, 250 kVa	16,630	22,400	17
Use engineered nozzles	143,000kWh, 250 kVA	13,470	390	1
Repair water leaks	1,740,000 gallons	10,440	85	1
Use synthetic lubricants	104,700 kWh	8,900	0	Immed.
Repair steam leaks	860 MMBtu	8,100	500	1
Lighting management	91,600 kWh	7,800	0	Immed.

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