



ENERGY SYSTEMS OPTIMISATION (ESO)

FELTEX AUTOMOTIVE Year 2 – 2013/14

BACKGROUND

Feltex Automotive, headquartered in Durban, consists of seven business units that supply products directly and indirectly to South African Original Equipment Manufacturers (OEMs).

The Feltex Automotive Trim plant, located in Rosslyn Pretoria, is a leading supplier of textile-based automotive acoustic and trim components. It produces technical felts in needled and airlay constructions and non-woven carpets (both structured and conventional) in a broad range of weights, widths and specifications, for mouldable applications. From its factories direct to customers, Feltex Trim supplies main floor carpets, passenger compartment insulation, trunk packages, engine compartment insulation, parcel shelves and exterior wheel arch liners.

Most of the processes require the following activities:

- Heating of material. The heating is mainly supplied by electricity.
- Most of the equipment requires compressed air for operation. Although two compressors are installed, one compressed is off-line due to various improvements to the reticulation and requirements for compressed air. Compressed air is currently supplied through one 75 kW compressor.

THE ISSUE AND MAIN FINDINGS

Key findings: After an investment of ZAR 197 600 a saving of ZAR 99 519, with a payback of 1.98 years has been realised. Some other energy conservation opportunities have also been identified however are not highlighted in this case study.

215 611 kWh reduction
per year

213 tons CO₂ reduction
per year

ENERGY CONSERVATION OPPORTUNITIES IDENTIFIED



ECO1: Installation of small air compressor to supply weekend load

The requirement for compressed air throughout the plant over weekends was assessed. It was found that at the foaming plant compressed air was needed to circulate the foam in the storage tank. To match this process need, a 2.2 kW compressor supplying air at 3 Bar was installed. This made the operation of the main 75 kW compressor at 6 Bar over weekends redundant.



ECO2: Replace resistive heater coils with infrared lamps

Carpets are heated at line 3 before they are pressed in the required shape. The traditional way of heating the carpets was to use 36 resistive heater elements rated at 2 kW each. These heaters take a long time to heat up and consequently are not switched off between carpets. They were replaced with 48 infrared heaters rated at 1.5 kW which heat up instantaneously. Controllers of the process were reprogrammed so that the heaters only switch on when there is a carpet in the machine. The time required in the oven also reduced from 80 seconds to 45 seconds.



ECO3: Buffer plates at line 2

At line 2, heated air is used to pre-heat carpets before they are glued and pressed. Air is heated through 36 elements rated at 1 kW each. Previously, the carpets were conveyed into the oven on a grid conveyor. The consequence was that hot air by-passed the carpet and followed the path of least resistance. Consequently the carpets took a longer time to pre-heat to the required temperature. Various sized buffer plates were manufactured in-house to match the varying carpet sizes. The buffer plate prevents hot air from following the path of least resistance and heat is efficiently applied where it is required; on the carpet. The result is that carpets are now pre-heated within 45 seconds compared to 90 seconds.



ECO4: Use of natural light

In a section of the plant, the corrugated roof plates were replaced with translucent roof plates to make use of natural light instead of artificial light during the day-shift. This resulting in 50 high bay lamps rated at 125 W being switched off between 18:00 and 6:00 where they were previously operational 24-hours.

IMPLEMENTED SAVINGS MEASURES

ECO/WCO	Capital Cost ZAR	Savings ZAR	Payback Yrs	Environmental Benefit
ECO1: Installation of small air compressor to supply weekend load	R10 000	R36 700	0.27 yrs	<ul style="list-style-type: none"> • 101 192 kWh pa • 100 ton CO₂ pa reduction
ECO2: Replace resistive heater coils with infrared lamps	R57 600	R33 770	1.7 yrs	<ul style="list-style-type: none"> • 61 401 kWh pa • 60 ton CO₂ pa reduction
ECO3: Buffer plates at line 2	R0	R19 356	0	<ul style="list-style-type: none"> • 35 193 kWh pa • 34.8 ton CO₂ pa reduction
ECO4: Use of natural light	R130 000	R9 693	13	<ul style="list-style-type: none"> • 17 625 kWh pa • 17 ton CO₂ pa reduction
Total	R197 600	R99 519	2 yrs	<ul style="list-style-type: none"> • 215 611 kWh reduction per year • 213 t CO₂ reduction per year



Enquiries



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