

RECP Best Practices Catalogue

*Replacing the steam impregnation booth
with an electric booth*

Developed within the framework of MED TEST II



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



The SwitchMed Programme is
funded by the European Union

Best Practice - Replacing the steam impregnation booth with an electric booth

SECTOR:	Manufacture of basic metals, electrical equipment, motor vehicles, fabricated metal products
SUBSECTOR:	Manufacture of parts and accessories for motor vehicles
PRODUCTS	Friction products for clutches and brakes.
CATEGORY	Process control or modification
APPLICABILITY	Process

COMPANY SIZE	100 full-time employees
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Description of the Problem (Base Scenario):

The company has two impregnation booths that cover a copper wire with a paste prepared beforehand in the mixer and let dry in a curing chamber. The temperature of the curing chamber is between 120 and 130 °C and the time of curing is on the order of 20 minutes.

Thermal energy is provided by steam in the first Cabin and by electrical resistance in the second. The figure, opposite, shows a photo of the impregnation booth.

Given the obsolescence of the steam booth and the energy losses in the steam delivery loop, we found that impregnation by steam is very expensive.

In fact, steam impregnation costs six times more than the electrical process



Description of the Solution

We propose converting the steam booth into an electrical booth. To do this, it is necessary to install electrical resistors with a total power of 40 kW governed by PID controllers. This project will allow definitive stopping of boiler use, reduce the cost of maintenance and maintain a more stable temperature in the curing chamber.

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Economic Gain

Operational gains are estimated to be € 9,382/year.

Environmental Gain

The environmental impact brings a reduction in propane consumption of 28.8 tons per year but causes an additional electricity consumption of 146,000 KWh/year. The balance sheet is negative, producing a total of 21 tons of CO₂e/year.

Other advantages include: saving water as the new booth no longer requires steam.

Saving chemicals used in boiler water preparation, reduction of waste water, especially boiler blow down purges

Health and Safety Impact

The impact is positive (reduced fire and explosion risks related to the use of propane. Reduced risk of burns to employees who may be in contact with hot steam or touch hot pipes that are poorly insulated)



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Investment and Financial Indicators	We estimate an investment of € 13,636 (Time for Return on Investment: 18 months)
Suppliers	Suppliers of impregnation booths
Other aspects	No particular risk is to be feared, except to ensure that the renovation is done using state of the art technology.
Implementation and new indicator	Scheduled for the end of 2018