

SOUTHERN PACKAGING CASE STUDY

Elimination of polluting emissions
from large air flows: 233,000 Nm³/h.



Equipment: RTO + 2 Zeolite rotor-concentrators.

Installation: 2017

Customer:

Foshan Southern Packaging.

Project size:

233,000 Nm³/h.

Location:

Foshan, Guandong (China).

Industry:

Packaging.

Activity:

Manufacture of polyethylene packaging,
dunnage bags, liners, shipping supplies, FIBCs.

SOUTHERN PACKAGING



ABOUT SOUTHERN PACKAGING

Southern Packaging, LP is the leading plastic packaging manufacturer providing supply chain solutions to manufacturers around the world. Southern Packaging, founded in 2004, has grown rapidly to become one of the largest manufacturers of plastic packaging in China and globally.



南方包装集团有限公司
Southern Packaging Group Limited

THE CHALLENGE

Southern Packaging needed to eliminate the pollutant emissions that were generated during its rotogravure plant printing processes. This production centre is located in a very densely populated urban area, Foshan, which belongs to Guangdong province and the Pearl River Delta economic area, with more than 110 million inhabitants in 2019. The factory had to adapt to the new legal requirements demanded by the Chinese authorities, increasingly demanding with the limits of pollution and, especially, for the industry located in the cities.

Other features

- Very variable air flow rates, given that the factory has 8 printing lines plus one lamination line, and the simultaneity is very variable. All lines may be running at the same time or only a small part of them.
- VOCs concentration is highly variable, depending on the production phase in which each production line is.

Some figures

- Volume of polluted air to be treated: 233,000 Nm³/h
- Inlet temperature: 33 - 45 °C
- VOC concentration: <1 g/Nm³
- Dust concentration: <0.3 mg/Nm³
- **Chemical composition:**
 - Ethyl acetate (42 % weight)
 - Ethyl alcohol (11 % weight)
 - Normal propyl acetate (36 % iso-Propanol)
 - Ethanol (8 %)
 - Propylene glycol monomethyl ether (3 %)

THE TECAM SOLUTION

After analysing the customer's needs, Tecam proposed the solution of a system consisting of two pre-filters + two Zeolite rotor-concentrators + a Regenerative Thermal Oxidizer (RTO) + a recuperative steam boiler.

Due to the large amount of polluted air to be treated, the project required the installation of two Zeolite wheels working in parallel. Thanks to these and through an adsorption process to accumulate solvents, a higher concentration of solvents can be obtained for their subsequent processing in the RTO equipment and thus reduce the load of pollutants.

Each Zeolite rotor-concentrator, from the North American brand Munters, has a concentration ratio of 9 to 1 and an efficiency in eliminating VOCs of 95 %.

In relation to the pre-filters, they have four degrees of filtration, from G4 to F9.

The RTO unit is 50,000 Nm³/h in size. It is designed to treat polluted gases at a temperature of 800 °C - 850 °C and ensure a residence time of the gases in the combustion chamber of at least one (1) second. These conditions are sufficient to guarantee that 99.9 % of VOCs are eliminated.

This solution is the most convenient for cases in which there are large volumes of polluted air that contain low concentrations of VOCs.

In this case, Tecam installed a hot-bypass or emergency gas outlet directly from the RTO combustion chamber to a steam boiler, in order to control the combustion chamber temperature within stable parameters in case of high concentrations, and at the same time recover that excess energy by generating steam.

Southern Packaging is recognized by local authorities as **"a model for a sustainable urban industry."**



Cost savings: One ton of steam at 6 bar and 160 °C/h is incorporated into the production process for self-consumption.



THE RESULT

The result of the solution designed and installed by Tecam was the elimination of polluting gases from this rotogravure printing plant, even below the limits required according to environmental regulations (VOC ≤ 50 mg/m³ and NO_x ≤ 50 mg/m³).

Likewise, the guarantee of thermal efficiency is at least 97 %. In addition, the guarantee of functional performance is 99 % during the operation of the plant.

Some of the advantages of the installed solution are:

- Large flows of treated air: up to 116,000 Nm³/h for each Zeolite rotor-concentrator.
- Low consumption of gas and electricity.
- Minimum annual maintenance cost.
- Cost of implementation more economic than other technologies.
- High degree of automation.

This Tecam solution is perfect for treating large volumes of polluted air containing low concentrations of VOCs.

THE BENEFITS

The project was carried out adapting the design to the conditions of the factory and the installation of the equipment was made without interfering with the normal operation of the production equipment to minimize the impact on the customer.

Likewise, the customer obtains cost savings in its processes, because the installed boiler generates one ton of steam per hour (1 t/h), which is incorporated into the production process for self-consumption. The average savings in steam production amounts to around 10,000 EUR/month.

Tecam has achieved the elimination of 99.9% of pollutant emissions at this production plant in China.

A previously polluting environment has now become a healthy and safe space, which more than meets the required emission limits. The Southern Packaging factory in Foshan has become a model for sustainable urban industry and has been recognized as such by the local authorities.

ABOUT TECAM

Tecam is an environmental technology company focused on the development of customised solutions for emissions and hazardous waste treatment for large companies.

Tecam designs and implements customised projects aimed at minimizing the ecological footprint generated during production processes, with proven expertise in the Petrochemical and Oil & Gas sectors.

The company's work philosophy is based on long-term collaboration. With Tecam, there will always be a team of experts in environmental technology available to you to provide the solutions your business needs, wherever and whenever you need them.



If you are interested in obtaining further technical details on this project or learning more about Tecam engineering solutions for emissions treatment and waste valorization, please contact us - we will be happy to help you:

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