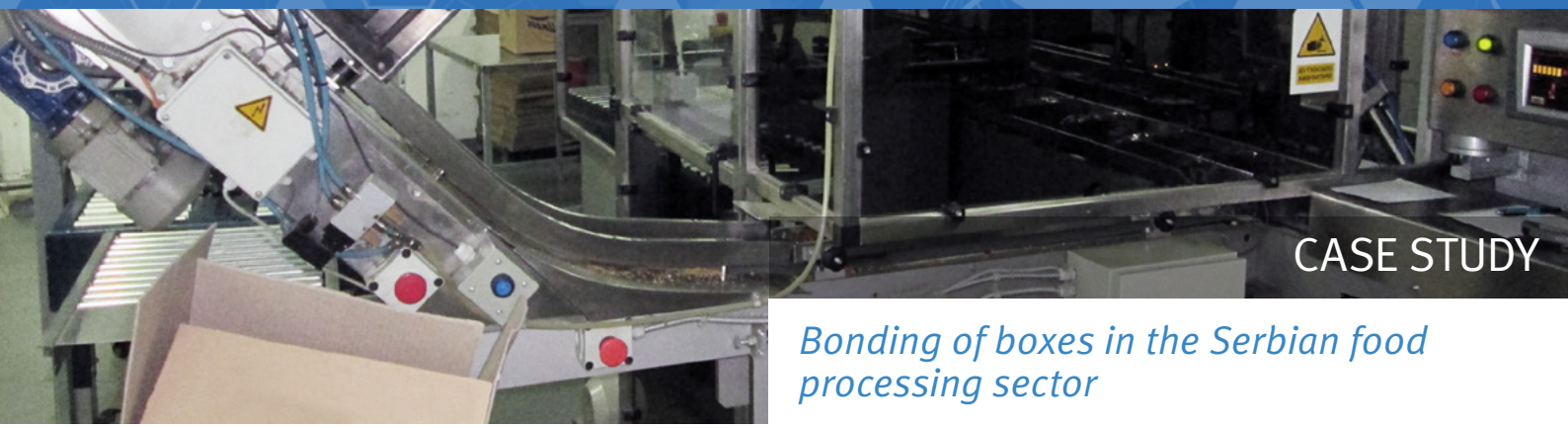
UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Chemical Leasing



CASE STUDY

Bonding of boxes in the Serbian food processing sector

1. Background information

Adhesives are part of a variety of food packaging materials. They can be used to manufacture rigid cardboard packaging (bonding of boxes) or to seal flexible packaging, including wrappers, pouches and lidding films. They can bind together layers of materials that come in contact with food or they can attach labels to an article to designate its origin. It is strictly forbidden by legislation to use adhesives in a way that could negatively affect food, change the nature, substance or quality of the food or could make it harmful to health and/or the environment.

2. Introduction

A Serbian confectionary company, Bambi Banat, was approached by Henkel, one of the global leaders of chemical solutions for adhesives in the packaging business, with a proposal to improve the packaging processes. Henkel proposed the usage of a new adhesive as it would enable the user to reduce packaging costs and improve environmental performance at the same time. Joint industrial trials were conducted to test the new solution before it was finally agreed that Chemical Leasing would be the most adequate means to introduce the new adhesive to the packaging processes of Bambi Banat. The Chemical Leasing contract was signed and prolonged on a yearly basis.

3. Key changes and results

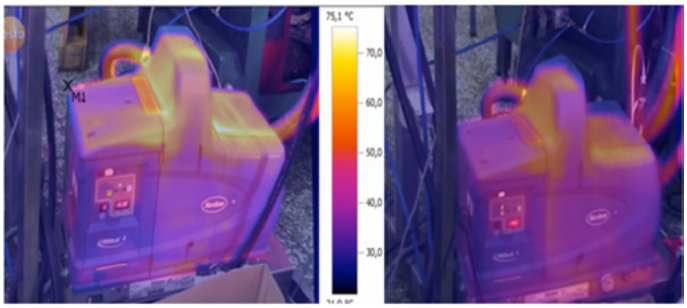
The Chemical Leasing business model was successfully implemented on six packaging lines. A new adhesive was chosen for the bonding of more than 20 different types of boxes in varying shapes and sizes. The product innovation came along with several process innovations related to the adjustment of process parameters, bringing a significant reduction of adhesive consumption. Chemical Leasing enabled the Serbian company to cut costs significantly and to achieve environmental, economic and social benefits at the same time.

3.1 Unit of payment applied

Before Chemical Leasing:	EUR per kilo of adhesive
After Chemical Leasing:	EUR per bonded box (taking into account the box type)

3.2 Technical measures tested and implemented

The former polyvinyl acetate based adhesive was replaced by a hydrocarbon resin based one. Technically, the adhesive was first melted and then dispensed to the surface of the boxes. For its efficient application, the process parameters, such as temperature and pressure, were optimized (lowered) compared to the situation before the introduction of Chemical Leasing.



Heat emission before and after ChL

3.3 Results achieved

Before Chemical Leasing	After Chemical Leasing (2010 onwards)
• Operating temperature was 160°C • Operating pressure was 2.9 bar • Adhesive was added manually into the reservoirs • Melted adhesive had an unpleasant smell • The dispensing nozzles got clogged during the application due to the high-temperature melting process of the PVA based adhesive. This led to shortages and additional maintenance work	Environmental benefits: • Consumption of the adhesive significantly reduced (more than 30%) • Energy consumption reduced (new operating temperature 130°C, new operating pressure 2 bar) Economic benefits: • Costs for the adhesive were reduced by €4,000 per year • Energy costs were reduced • Maintenance costs were reduced by €10,000 per year • The team efforts of user and supplier created the basis for a long-term relationship Social benefits: • The automatic dosing system reduced the possibility of workers suffering burning injuries • Working conditions were improved: the new adhesive was odourless • Workers were trained on the safe use of chemicals