



# Global productivity analysis of GREIF Inc. world leader in packaging

## The Movicon.NExT™ and Pro.Lean solution chosen by Greif Inc. for 115 production sites worldwide

GREIF Inc. (NYSE: GEF, GEF.B) is a world leader in the products and services sector for industrial packaging. The company went into operation 140 years ago and now manufacture steel, plastic and fiber drums as well as containers of various sizes, reconditioned containers, products made with flexible materials, big bags, containerboards, uncoated and coated recycled containerboards, liners, corrugated sheets and boxes, tubes and cores and a diverse mix of specialty products. GREIF also manufactures packaging accessories and provides services that include filling and packaging for a vast range of sectors and manages timberlands in the southeastern United States. The company ranks 642 in Fortune 1000 and is strategically positioned worldwide with 17,000 employees operating from 292 production, warehouse and office sites that serve regional as well as global customers in 43 countries.

### GREIF's needs

GREIF needed to implement a unified and coherent production supervision and management system in 115 production plants, which allowed targeted investment and sustainable costs and, above all, faster performances and installation standards. The company had already test run a North American software product but it did not comply with their needs. After already having made a selection of potential software providers, the GREIF managers were notified about applications that had been designed with Movicon and deployed in some European manufacturing plants, thus added Progea to their list. Subsequent analysis and meetings between Progea and GREIF in Europe and in the USA proved how the proposed Movicon.NExT and Pro.Lean solution could completely satisfy GREIF's demands for flexibility, quick deployment with global installation support



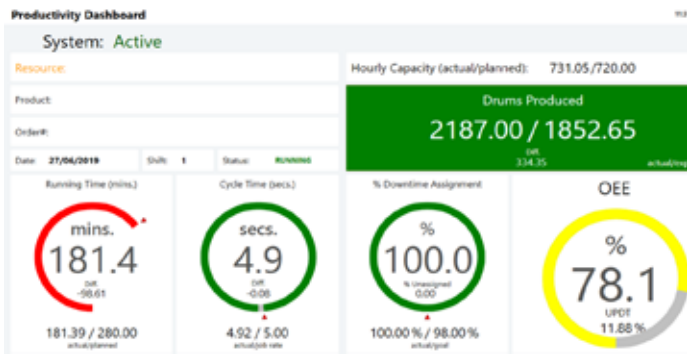
and cost effective according to their budget plan. After piloting the first projects in Italy and the USA, GREIF was able to see how the product would function perfectly, with the aid of the custom configuration wizard, and easily deployed in all their 115 plants with seamless data collection and standardization within the set deadline.

## The solution

Given their need to automate the design engineering of the plants, in particular to collect data in a local SQL database and create a customized Overall Equipment Effectiveness (OEE) solution, Progea performed an analysis based on GREIF's requirements and prepared a customized installation Wizard based on the piloted project's design. Once validated at global level, the project entered into the operational phase allowing local system integrators to use the step-by-step configuration wizard to automatically generate each individual local project and completely install the hardware and software in each plant in a record-breaking time of 4-5 days only. The system can monitor production flows in real-time and calculate the OEE without stopping production. This is done by means of using the KPI indexes and analyzing downtimes exactly as explicitly specified by GREIF. The project has almost reached its final

phase in just 18 months and has been installed in all facilities located worldwide for all production lines and plants: around 115 production plants in over 35 countries.

The GREIF production lines manage great volumes and need to be able to perform at their best. The OEE index control is an essential feature that helps obtain the maximum performance out of the production lines. The downtime and micro downtime analysis has made it possible to optimize production line flow through synchronizing the velocity of the various production phases. The results have instantly brought great advantages for both production line operators and managers who benefit economically when achieving the set performance goals. The Movicon.NExT and Pro.Lean systems connect to the production line PLCs that vary from plant to plant. The predisposed Wizard aids the operator to configure the project according to the needs and production configuration of each individual plant to automatically create the project locally. Data collected from the field are recorded by the Historians on Database and calculated to obtain the productivity indexes and analyzed for downtimes. The system generates reports that are then analyzed by the production manager of each plant. Furthermore, one of



the project's key needs was to be able to have data classified by plant and geographical area in the Cloud at a global level in order to allow company management to carry out an overall performance analysis from their company Headquarters in Delaware, Ohio (USA). The Movicon system of each plant transmits calculated data in a SQL Azure architecture, connected to Dashboards created with Tableaux.

## The different project phases

This challenging project was design engineered by Progea and installed in a major part of the GRIEF plants within a year and a half. The last phase is expected to be completed by the agreed end of 2019. The first phase involved long and meticulous analysis teamwork with GRIEF's Data Analysts to create a list of project needs and features. Based on this first analysis, the team in collaboration with the GRIEF specialists then processed a method to standardize information, data parameters and metrics to collect from all the production lines and plants in order to perform an accurate productivity analysis.

These data were of crucial importance because they included the causes of machine/production line downtimes and micro downtimes that permitted GREIF to regulate their production lines accurately and optimize production efficiency to a level never reached before.

## The HMI side

The HMI side was also planned and designed engineered with a series of customized graphical screens together with GREIF. The

graphical interface is used in each plant to collect and display all information in real-time. Various screens have been installed in various touchscreen workstations positioned alongside the production lines to display all the information that is not automatically available from the PLCs, such as shift changes, rejects and manual downtimes. This is used to highlight and provide the operator with real-time production data concerning what batch is effectively in production mode and the current production line status (stop, alarm or pause mode) for which the operator is required to enter details of cause.

Directly from the homepage, operators can view information relating to the production currently in run mode. This information includes production batch, recipe in production, machine name or line, number of pieces produced, total running time and downtimes, estimated and actual cycle time. This information allows the operator to assign downtimes manually and where necessary by selecting the category and the relative inactivity times from a list to avoid making errors. The Movicon Dashboards have been specifically designed to clearly display real-time production data relating to the various work shifts, productivity efficiency key indicators schedules, times, OEE, KPI, Downtime and other on maxi-screens.

These Dashboards have been distributed along each production line and displayed on maxi-screens or big operator panels using the Movicon multi-monitor feature that allows operators to manage different monitors and displays that are connected to the PC station. They can also be displayed on remote

computers within the plant or in company meeting rooms or any other remote location by using web browsers with the Movicon Web Client HTML5 technology.

## The Pro.Lean Wizard

Pro.Lean is Movicon's optional module that analyzes productivity efficiency. One of the big advantages this tool offers comes from using its configuration Wizard that enables users to create projects to calculate KPI, OEE and Downtimes within a few minutes. The tight deadlines for global deployment were easily met with the help of using this tool and which Progea had customized for GRIEF based on their needs and the project's features that had been defined when developing the pilot projects.

The Pro.Lean Wizard is a tool that provides a step-by-step procedure to allow users to import a specific plant's information and parameters from an Excel spreadsheet or set and save them manually on SQL database tables. This model is then used to parameterize and automatically create an entire Movicon Pro.Lean application by generating the project included with Dashboard, Historian, OEE calculations,

Downtime and a detailed report system, which is accomplished in minutes. This tool enabled GRIEF to quickly install and run a performance analysis system with guaranteed results without stopping the production line machines and avoiding the risk of local customized configurations that were noncompliant to the customer's specific needs.

## Global analysis in the Cloud

The last Group project goal was to obtain easy access to global or local data analysis by means of using a Cloud platform. It was essential that calculated data from each plant could be entered and systematically updated within a global analysis architecture based on Cloud computing. In order to achieve this, the Progea specialists worked with the client's chosen Tableaux solution to organize big data in a way that was transparent and efficient. Movicon.NExT provides great field and Cloud platform connectivity with a SQL Azure-based solution. Movicon.NExT connects to field data, prepares the calculation process with efficient use of data and storage in the Cloud where data from all the plants can be analyzed using purpose-built dashboards as requested by the client.



### Did you know?

Greif is ranked 642 in Fortune 1000 and operates strategically from 292 sites with 17,000 workers in 43 countries Worldwide!

### Reached targets

With the project almost concluded, GRIEF has been able to optimize its overall productivity significantly by monitoring the productivity of each one of its plants.

The GREIF management are very satisfied with the choice they made emphasizing that, compared to the other types of solutions available on the world IT market, Progea offered better solutions for openness, modularity and flexibility and the ideal tool to use in the world of Operating Technology (OT) and Information Technology (IT). In addition, GREIF have found a true partnership with Progea who have worked and supported them in designing and installing the project in their various plants worldwide.

The proposal to customize the Pro.Lean module's wizard solved the client's main concern exactly as they wanted.

The client did not want the solution to be conditioned by the local choices made by each of the plant managers worldwide but instead wanted to adopt a unique solution by deploying a flexible project template that could adapt to the specific needs of every plant using the same user interface, calculation method, operation procedures and interconnectivity. Movicon. NExT's flexibility of deployment, vast range of integrated I/O Drivers and clear and modern visual graphics have made it possible for GREIF to reach their targets ahead of the set deadline and at a lower cost compared to other competitive products they tried out during the evaluation process.

