



FACTS AT A GLANCE

Company: ECO FOX

Website: www.ecofox.it

Description: ECO FOX is a leading company in the production and commercialization of biofuels with high standard and quality. ECO FOX aims to reduce dependence on crude oil with the production of vegetable oils (sunflower, soybean, canola, palm), biodiesel and, as a byproduct, crude glycerin. The company currently produces more than 200,000 tons of vegetable oils per year.

Employees: 28

Industry: Speciality Chemicals

Country: Italy

PRODUCTS USED:

- CADWorx® Plant Professional (including CADWorx Steel, CADWorx Design Review)
- CADWorx fieldPipe™
- PV Elite®
- PV Fabricator®
- Isogen®
- CAESAR II®

KEY BENEFITS:

- Accelerated schedule
- Optimized production
- Higher product quality
- Increased productivity

ECO FOX IMPROVES REFINERY PRODUCTION EFFICIENCY AND OPERATIONS WITH INTERGRAPH® CADWORX® AND ANALYSIS SOLUTIONS

Leading biofuel provider relocates existing equipment to improve production, quality, and profitability of its Vasto plant .

IDENTIFYING GOALS

ECO FOX S.r.l., located in Punta Penna, Vasto, Italy, is a refinery company and leader in biodiesel production from renewable resources. To increase profitability, the company decided to improve its glycerin refining process in its existing refinery. To do this, several changes were required with regards to the existing plant's processes, equipment, and overall layout. Rather than design, fabricate and install entirely new equipment from scratch, ECO FOX decided to purchase and install existing equipment from another plant located elsewhere in Italy. The project was awarded to OMA S.p.A., a leading Italian construction company.

OVERCOMING CHALLENGES

First, OMA conducted a constructability study to evaluate how to retrofit the purchased equipment into the existing facility, including the introduction of new structures needed to support the incoming equipment. The major challenge was mapping equipment inside the existing structure to ensure that any new piping routes and tie-ins needed for the new equipment were optimized and clash-free. To meet the challenge, OMA chose Intergraph® CADWorx® and Analysis Solutions software to be used on the project.

Due to the very limited space at the Vasto facilities and the irregularity of the existing plant layout, as well as the inconsistency of existing plant information or total absence of documentation, OMA proposed that ECO FOX use laser scanning technology to obtain an accurate 3D point cloud of the existing facility. By doing so, contractors could ensure that the new equipment, piping, and structure would fit.

REALIZING RESULTS

To accelerate the construction phase and in turn enable ECO FOX to start production sooner, CADWorx fieldPipe™ in combination with CADWorx Plant Professional were

used to create a complete, accurate, intelligent, and integrated 3D as-built and design model. This provided the basis for the constructability and interface studies. It also helped plan the dismantling of the existing plant and the construction sequence for the introduction of new plant items.

Using the as-built model and point cloud as the design basis, OMA was able to develop new piping designs easily and accurately using CADWorx Plant Professional. The purchased equipment was also scanned in the laydown area and modeled to provide 3D models that could be used during construction simulations.

CADWorx Design Review was used to identify available space, optimize layout, and determine if the purchased equipment would fit into the building. This also included evaluating whether or not the current structure would require changes to accommodate the additional weight of the new equipment being introduced. Several modifications were identified and CADWorx Steel was used to design new structures and align the elevations of key supporting beams.

In total, OMA introduced 96 new pipelines and remodeled approximately 30 existing pipelines after checking for possible interference and available space. 40 pieces of new equipment were installed in a space of 175m², with some existing equipment dismantled or relocated elsewhere in the plant. From the 3D model, Isogen[®] was used to produce piping isometrics for fabrication; accurate bills of materials were produced for procurement; and plot plans, piping layouts, and 3D views were created for dismantling and construction. CAESAR II[®] was used to engineer and ensure stress-free and safe designs, which were produced for both the new piping and tie-ins made to existing lines.

For the new equipment, D-01, a soda reactor, and F-01A/B/C, active carbon filters, seismic behaviour was analysed. The new

equipment models were designed using PV Elite[®] and detailed with PV Fabricator[®]. Then, using its ability to share model data bi-directionally, the models were interfaced and updated with CADWorx Plant Professional, enabling the completion of piping connections to the equipment.

During the construction phase, problems occurred during piping installation, resulting in costly on-site rework being necessary. OMA's sub-supplier who had installed the equipment claimed that the deliverables produced from the 3D design model provided by OMA were incorrect. To remedy the situation, OMA laser scanned the positions of the new equipment, then, using CADWorx fieldPipe, overlaid the point cloud on top of the design model to check for any deviations. This approach proved that the subcontractor had inaccurately installed the equipment. The use of laser scanning in combination with Intergraph CADWorx solutions validated the work performed and avoided significant construction costs for OMA.

MOVING FORWARD

Overall, the project greatly benefited from implementing Intergraph CADWorx & Analysis Solutions, as seen in:

- Better decision making due to the merger of point clouds with 3D design and photo-realistic visualization and
- Schedule acceleration due to more efficient work processes via intuitive, integrated, and easy-to-use CAD and CAE tools

A key benefit for ECO FOX was the handover of intelligent engineering information and high-quality documentation, including isometrics, P&IDs, equipment details, GAs, and layouts. The 3D model will provide an as-built design basis for future plant modifications. ECO FOX considers the project to have been a tremendous success, and will mandate Intergraph's solutions to be used by other contractors on their future projects to deliver improvements to Vasto plant.

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