



FRONT-END ENGINEERING STUDIES



ZARPAC Front-end Engineering Studies (F-EES) provide a great starting point and a solid foundation for any packaging line project

A ZARPAC Front-end Engineering Study (F-EES) is a documented analysis and assessment of the estimated cost, projected timeline, risks and feasibility of a full or partial packaging line project.

F-EES are prepared by ZARPAC engineers and project managers with extensive expertise in packaging machinery and packaged goods manufacturing processes.

F-EES provide a blueprint for a project that can help a customer evaluate and justify a potential project or accelerate the execution of an approved project.

ZARPAC Front-end Engineering Studies are offered in a three-tier structure based on the scope of required study deliverables and the required accuracy for line layouts, project cost estimates and timelines.

F-EES OVERVIEW

Every ZARPAC F-EES begins with specifications and production requirements provided by the customer. A list of study requirements can include hundreds of specific items but at a minimum it includes the products, the types and sizes of primary packages, the types and sizes of secondary packages, and the production speeds for every container to run on a line.

Our team of experienced packaging line engineers and project managers then get to work. When their work is completed the customer gets a blueprint and game plan for their project.

We do the work. Your team gets to remain focused on getting product out the door.

FEATURES AND BENEFITS

- **A la Carte Study Deliverables** - Customers define the scope and deliverables of each F-EES to fit their specific needs, requirements and budgets.
- **Accurate Budgetary Project Costs** - All budgetary costs and vendor quotes are reviewed for relevance and accuracy.
- **Realistic, Experienced-based Project Schedules** - Eliminates the added costs of delays and late start-ups. Executable, real-world project schedules are built around what can happen and when, rather than what might or could happen.
- **Validated Packaging Line Design Tools for OEE Optimization** - Proprietary ZARPAC packaging line design tools help ensure line layouts and equipment selections deliver optimum OEE and line productivity. Our tools precisely calculate optimum machine placements in a line, optimum steady-state and surge machine speeds and optimum accumulation location and capacity.
- **Studies Completed by Multi-disciplinary Teams** - Dedicated ZARPAC engineers, project managers and packaging line designers are assigned to each F-EES. The team approach assures each deliverable is reviewed and evaluated from multiple perspectives which translates into completeness and accuracy.
- **Fast Study Execution** - Our team-based approach can produce quoted deliverables in 4 to 8 weeks depending on the project scope.
- **Single Source Accountability** - ZARPAC is solely responsible for the analysis and all deliverables which enables your staff to focus on their day to day responsibilities.

WHO USES FRONT-END ENGINEERING STUDIES? AND WHY?

Companies of all types and sizes, from members of the Fortune 50 to single location family businesses routinely use our Front-end Engineering Studies.

Our primary contacts within those companies are engineering managers, project managers and operations managers that need to start the planning process for a new packaging line or for upgrading or modifying an existing packaging line.

Our customers understand new packaging line projects that get off on the wrong foot never recover. They also understand the serious, negative financial impact that a poorly designed packaging line will have on their business.

A growing number of customers also simply lack the staff or engineering experience and expertise required to plan, design and implement a new packaging line.

That is where ZARPAC can help.

We bring deep packaging equipment, packaging line design, packaging line integration, and project management expertise to our customers.

We become extensions of customer teams and we provide expert engineering and project planning support without adding headcount.

Our repeat customers tell us that our F-EES consistently provide a valuable, fact-based foundation for new packaging line projects. They also tell us that our team of engineers and project managers routinely identify issues that their teams would never have considered. Our experts are highly regarded for answering questions that weren't asked but should have been.

Customers also rely on our F-EES because our dedicated team approach can complete an analysis much more quickly than internal resources with time consuming day-to-day responsibilities.

Bottom line, they value our ability to help them build a solid foundation for their packaging line projects in a timely and cost-effective manner.

POPULAR FRONT-END ENGINEERING STUDY DELIVERABLES

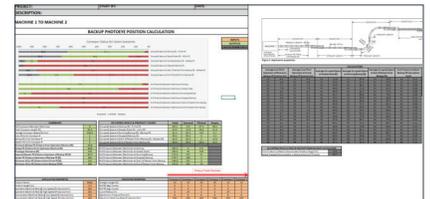
ZARPAC provides thorough, professional Front-end Engineering Studies with customer defined deliverables for new packaging lines or packaging line upgrades.

Popular F-EES deliverables include:

- CAD line layouts, either conceptual or detailed based on customer requirements
- Complete total project cost estimates
- Capital equipment cost estimates or quotes
- Site preparation & site modifications cost estimates
- Installation, acceptance testing, training, and start-up support cost estimates
- Project schedule and timeline
- Detailed site reviews including optional 3-D laser scanning of existing facilities to obtain precise dimensions and to identify constraints presented by the planned location for a new filling line
- Line component review, analysis and recommendation for each piece of equipment required in the packaging line
- Best Value Option Analyses (BVOA) for targeted vendors and equipment models
- Budgetary equipment specifications with budgetary pricing for all required equipment
- Detailed equipment specifications with formally quoted pricing for all required equipment
- Material handling and production flow analyses
- Packaging line staffing requirements including operators, maintenance personnel and support
- Mechanical and electrical utility requirements for all packaging line equipment
- Packaging line utility cost estimates
- Formal Request For Proposal (RFP) document suitable for submittal directly to potential vendors
- F-EES Formal Report containing and summarizing all deliverables



F-EES Deliverables are Customer Specified for Each Project



Validated ZARPAC Design Tools are Used in the Development of F-EES Line Layouts