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BEST PRACTICE

Transitioning Flexible Materials

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Introduction

SPONSORS



The Flexible Packaging Association is the U.S. association of the manufacturers of flexible packaging; and material or equipment suppliers to the industry. They ensure the industry is educated on an array of topics, from recent trends in the industry to changes in government relations and provide a variety of media to advocate for the flexible packaging industry.



PMMI is a trade association of more than 900 member companies that manufacture packaging, processing and related converting machinery in North America; machinery components and packaging containers and materials. PMMI's vision is to be the leading global resource for the packaging and processing supply chain, and its mission is to improve and promote members' abilities to meet the needs of their customers. Learn more about PMMI and the PACK EXPO trade shows at PMMI.org and Packexpo.com.



Facilitated by PMMI, the OpX Leadership Network is a dynamic community of manufacturing, engineering and operations professionals dedicated to operational excellence. Through open dialogue between CPG manufacturers and OEMs, the OpX Leadership Network provides an exceptional forum where the best minds come together to identify and solve common operational challenges, and apply best practices and innovative solutions to the real-world context of manufacturing.

RESEARCH TEAM



This Best Practices document was facilitated, analyzed and executed by PMMI Media Group Custom Research, the proprietary research arm of PMMI, The Association of Packaging and Processing Technologies. PMG Custom Research explores the trends driving your business, and your current position in the marketplace. If you have any questions or would like to inquire about a proprietary research project, please contact Jorge Izquierdo at jizquierdo@pmmi.org or Rebecca Marquez at rmarquez@pmmi.org.

TRANSITIONING FLEXIBLE MATERIALS SOLUTIONS GROUP

For the purpose of creating this document, PMMI assembled an expert solutions group, recruited through contacts provided by FPA, PMMI, and The OpX Leadership Network. Consisting of 11 CPGs/End users, 7 Material suppliers/converters, and 6 OEMs, the group had 10 full group meetings, each lasting an hour, and was further divided into 5 subgroups based on members' areas of expertise. There was a total of 15 subgroup meetings held, with each meeting lasting an hour. In addition, there were 13 meetings held between PMMI and FPA members, with approximately 18 hours spent between all meetings. Overall, the amount of time spent developing this best practice between all groups and individuals was close to 500 hours.

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About this document

TRANSITIONING FLEXIBLE MATERIALS

Transitioning flexible materials in consumer-packaged goods (CPG) operations can refer to a variety of processes, such as changing the type of packaging material used for a product, altering the design or shape of packaging, or modifying the equipment and machinery used to handle and package the product.

One key consideration when transitioning flexible materials in CPG operations is the compatibility of the new material with the existing equipment and machinery. For example, a new type of film or pouch may require adjustments to the sealing and cutting mechanisms on a packaging machine. It is important to thoroughly test and evaluate any new materials and equipment before implementing them in production to ensure they are capable and efficient.

This Best Practices document seeks to act as a guide in the process of transitioning flexible films in CPG operations. Overall, transitioning flexible materials in CPG operations requires careful planning, testing, and evaluation to ensure that the new materials are compatible with existing equipment or whether there is a need for new equipment. The transitioning process should strive to align with sustainability goals and meet product quality and shelf-life requirements.

CPG GOALS

There are several goals that companies may have when transitioning flexible materials in consumer-packaged goods operations:

- **Cost reduction:** Can be achieved by using less expensive materials, reducing waste, or improving production efficiency, and so forth.
- **Improved product protection:** Can be accomplished by selecting materials that provide better barriers against moisture, oxygen, light, and other factors that can degrade the quality of the product.
- **Enhance sustainability:** May involve using biodegradable, compostable, or recyclable materials that reduce waste and lower carbon emissions.
- **Mitigation of supply chain limitations:** Lack of availability may result in the need to transition materials.
- **Meet changing consumer preferences:** Consumers may be looking for packaging that is easier to open, resealable, or provides portion control.
- **Regulatory compliance:** New regulations or guidelines related to safety, labeling, or environmental regulations may impact materials selection.

By achieving these goals, companies can improve their bottom line, enhance their brand reputation, and meet the changing needs and expectations of consumers.

FOLLOWING THE PLAN

When using this document, it's important to remember that it's designed to be a guide, rather than strictly prescriptive. The Solutions Group who worked on this document fully acknowledges the variability of companies and their operations and has worked to create a flexible best practices document: a set of guidelines and procedures that provide a framework for achieving optimal performance and quality in a particular area of an organization's operations. Unlike a rigid set of rules or procedures, a flexible best practices document is designed to be adaptable to a wide range of situations and circumstances. This document was created through a collaborative process involving input from various stakeholders (our Solutions Group) and may be regularly reviewed and updated to reflect changing business needs and market conditions.

In addition to the variability from company to company, the nature of projects that involve transitioning materials is also dependent upon who, within the company, is the owner of the project. Materials transition can be driven by Marketing/Brand decisions, by Package Design and Development, or by some other factor, such as a change to the product. For the purpose of simplification and consistency, this document was created to reflect a project driven by a Marketing/Brand decision. For projects driven by other decision makers, the RACI assignments will need to be re-evaluated and updated.

HOW TO USE THIS DOCUMENT

This document is intended to be used by brand manufacturers as a guide to ensuring the process of transitioning flexible materials in packaging operations is efficient and successful by involving relevant parties at specific and appropriate points in the process, once the decision has been made to transition materials.

TRAINING

The best practices can be used as a training tool for operations personnel at every level. The document may be useful for new employees, as a training refresher, or for end users unfamiliar with transitioning flexible films.

TRANSPARENCY

This document may also be shared by OEMs with their CPG or brand manufacturer customers to provide more transparency and simplicity between all involved parties. Its use can help to reduce miscommunication or unwanted surprises, if any issues arise.

COLLABORATION

This document was created to help facilitate a much-needed collaborative process between end users and suppliers. Involved parties at each level play a critical role in the stages of transitioning materials. This document can be utilized to ensure all parties are proactive earlier in the process.

WHAT YOU'LL FIND IN THIS DOCUMENT

- Data on CPG materials usage and frequency of change.
- A FLOW CHART detailing the order of tasks required for transitioning flexible films on packaging lines.
- A RACI Matrix illustrating the level of responsibility for each of the relevant groups involved in the process of transitioning materials: Packaging Design and Development, Operations and Engineering, Marketing/Brand Owner, OEMs, and Materials Suppliers/Converters.
- Detailed information of each STAGE and TASK for transitioning flexible films in CPG operations.

Flexible Materials in Packaging - an Overview

The most frequently used packaging material for consumer-packaged goods in the U.S. is plastic. Plastic packaging is widely used due to its durability, versatility, lightweight nature, and cost-effectiveness. It is used for a variety of products such as beverages, snacks, personal care products, cleaning products, and more. Other commonly used packaging materials include paper and cardboard for items such as cereal boxes, tissue boxes, and paper bags, as well as glass and metal for products like canned foods and glass jars. However, plastic still remains the most widely used packaging material in the U.S.

As part of this project, we surveyed CPGs from PMMI's database of PACK EXPO attendees and PMMI Media Group content subscribers. The purpose of this survey was to measure what materials are most used among CPGs of all sizes and industries, and to gauge changes in the frequency in which companies are choosing to transition materials.

Of all respondents to our survey, a third use flexible plastic film (Figure 1), a common type of plastic packaging used in the U.S. This type of packaging includes items such as plastic bags, plastic films, and plastic pouches. According to the American Chemistry Council, flexible plastic packaging accounts for approximately 19% of all plastic packaging generated in the U.S. This amounts to around 7.8 million tons of flexible plastic packaging generated in the U.S. each year. However, it is important to note that this number may vary depending on the industry and specific types of products being packaged.

As shown in Figure 2, 35% of survey respondents mentioned transitioning of materials has increased within the past year, while 54% of respondents said it has not changed over the last 12 months. Compared to that, only 11% of respondents mentioned the material transition has decreased over the last 12 months. This portrays that CPGs are more willing to transition to different materials rather than not. The frequency of these transitions can vary depending on the company's specific circumstances, but it is not uncommon for companies to make changes to their packaging materials every few years or even more frequently. For instance, some companies may choose to transition to more sustainable packaging materials, such as bioplastics or paper-based materials, to reduce their environmental impact. Others may shift to different types of plastics or metals to improve product safety or comply with new regulations.

Further supporting the data, 48% of respondents have transitioned materials in their operations within the last 12 months at least once (Figure 3). The frequency of packaging material transitions also depends on the industry and product type. For example, companies in the food and beverage industry may need to make changes to packaging materials more frequently due to changing regulations and consumer preferences.

Consumer packaged goods companies may transition the materials they use for packaging for various reasons such as sustainability goals, cost savings, product safety, and regulatory compliance. Ultimately, the decision to transition packaging materials is dependent on a variety of factors unique to each company and product.

FIGURE 1: What material do you use, most frequently, as primary packaging for your products?

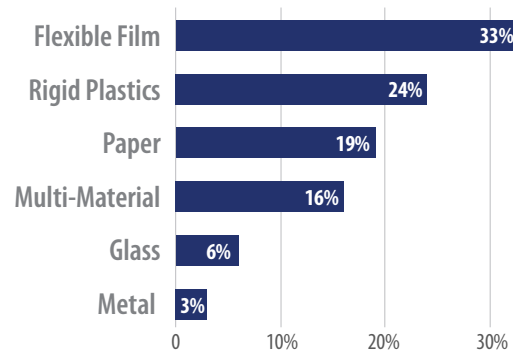


FIGURE 2: In the last 12 months, how has transitioning materials changed as compared to the last five years?

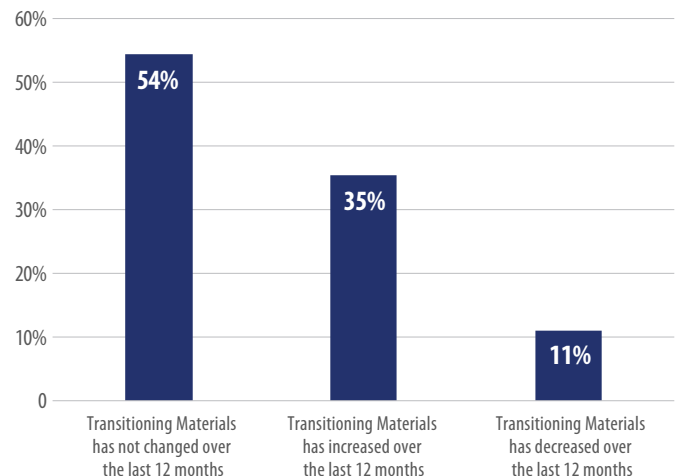
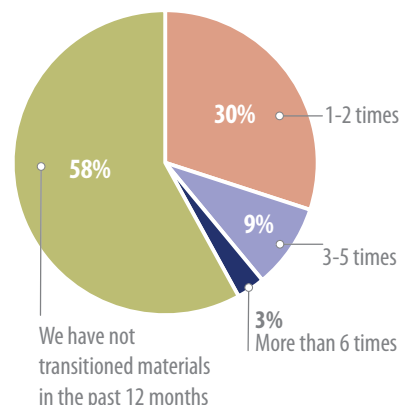
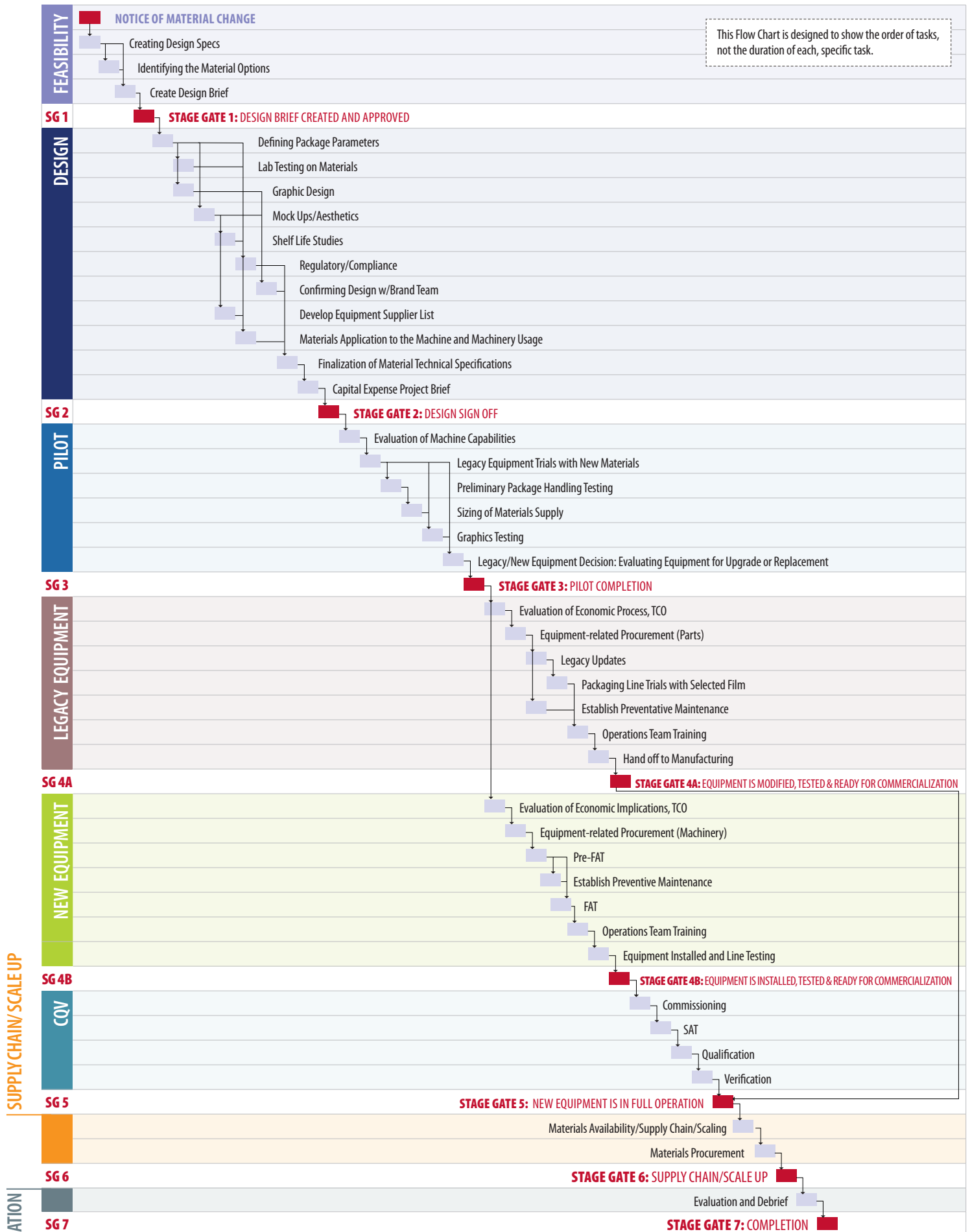


FIGURE 3: In the last 12 months, how often have you transitioned materials in your operations? E.g., transitioning from one type of film to another.



Task Flow Chart



RACI Matrix

MATRIX KEY

- R – Responsible** – those who execute the task
- A – Accountable** – ultimately must answer for the correct execution of the task
- C – Consulted** – those whose opinions and guidance are necessary for proper execution
- I – Informed** – those we want to keep up to date on the task

TASK NAME	PACKAGE DESIGN & DEVELOPMENT	OPERATIONS & ENGINEERING	MARKETING/ BRAND OWNER	MATERIAL SUPPLIERS / CONVERTERS	OEMS
FEASIBILITY					
Creating Design Specs	R		A		
Identifying the Material Options	R A	C	C	C	C
Create Design Brief	R	C	A	C	C
DESIGN & DEVELOPMENT					
Defining Package Parameters	R A	C	R	C	C
Lab Testing on Materials	R A		I	C	
Graphic Design	C	C	R A	C	
Mock Ups/Aesthetics	R A	I	R		C
Shelf Life Studies	R A	C	I	C	
Regulatory/Compliance	R A	C	I	C	
Confirming Design w/Brand Team	R	C	A		
Develop Equipment Supplier List	C	R A		C	
Materials Application to the Machine and Machinery Usage	C	R A		C	C
Finalization of Material Technical Specifications	R A	C		R	I
Capital Expense Project Brief	C	R A	I	I	C
PILOT					
Evaluation of Machine Capabilities	C	R A	I	C	C
Legacy Equipment Trials with New Materials	C	R A		C	C
Preliminary Package Handling Testing	R	R A		C	C
Sizing of Materials Supply (web sizing)	R A	R		C	C
Graphics Testing	R A	C	I	C	
Legacy/New Equipment Decision: Evaluating Equipment for Upgrade or Replacement	C	R A	C	I	C
LEGACY EQUIPMENT TRACK					
Evaluation of Economic Implications, TCO	C	R A	I	C	R
Equipment-related Procurement (Parts)		R A		C	C
Legacy Updates	I	R A		C	C
Packaging Line Trials with Selected Film	C	R A	I	R	C
Establish Preventative Maintenance		R A		C	C
Operations Team Training		R A			R
Hand off to Manufacturing	C	R A			
NEW EQUIPMENT TRACK					
Evaluation of Economic Implications, TCO	C	R A	I	C	C
Equipment-related Procurement (Machinery)		R A		C	C
Pre-FAT	C	R		R	R A
Establish Preventative Maintenance		R A			R
FAT	R	R A	I	R	R
Operations Team Training		R A			R
Equipment Installed and Line Testing	C	R A	I		C
CQV (COMMISSIONING, QUALIFICATION, VERIFICATION)					
Commissioning	C	R A		R	R
SAT	C	R A		R	R
Qualification	I	R A	I	R	R
Verification		R A		C	R
SUPPLY CHAIN SCALE UP/COMMERCIALIZATION					
Materials Availability/Supply Chain/Scaling	C	R A	R	C	
Materials Procurement	C	R A	I	C	
EVALUATION (DEBRIEF)					
Evaluation and Debrief	R	R	A*	C	C

* Accountability for the Debrief is dependent on the owner of the project. For the purpose of simplification and consistency, the RACI matrix above reflects a Marketing/Brand driven project (see page 4)

START Notice of Material Change

FEASIBILITY

After the decision to transition flexible materials has been made, a notice of materials change is issued by the requesting body. The initial stage of a transitioning materials project is where the feasibility of a change in material is assessed. The design specifications and options for new material are evaluated to ensure that material selections are viable and practical, resulting in a design brief. The design brief typically includes information on the intended purpose of the product, its target market, budget, and any technical requirements. It may also outline the desired aesthetic and branding qualities of the product, as well as potential materials or manufacturing techniques that should be used.

Overall, the design brief serves as a roadmap for the manufacturing process, helping to ensure that the final product meets the client's needs and expectations.

- Creating Design Specs
- Identifying the Material Options
- Create Design Brief

STAGE 1: FEASIBILITY

FEASIBILITY

Creating Design Specs

DESCRIPTION

Creation of the package design specifications, including, but not limited to: physical properties, product containment requirements, and branding requirements. Although this document may not answer all questions related to this project (e.g. final material choice), the specifications that are created in this task should serve as a touchstone throughout the duration of the project.

PREDECESSOR

Notice of Material Change

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R ● ● ● Define package structure design. Includes potential materials, necessary barrier properties, physical properties, and dielines.
OPERATIONS AND ENGINEERING	● ● ● ●
MARKETING/BRAND	● A ● ● In addition to providing brand architecture and design intent, as the owner of this project, Marketing/Brand should provide scope and materials transition justification.
MATERIAL SUPPLIERS/ CONVERTERS	● ● ● ●
OEMS	● ● ● ●

Identifying the Material Options

DESCRIPTION

Identification of materials and defining list of materials suppliers including, but not limited to, determining sole source supply, evaluation of supply costs, timing and locations.

PREDECESSOR

Creating Design Specs

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R A ● ● Identifying project appropriate materials and vendors in collaboration with Procurement and Quality.
OPERATIONS AND ENGINEERING	● ● C ●
MARKETING/BRAND	● ● C ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

FEASIBILITY






Create Design Brief

DESCRIPTION

The development of the completed specification document for circulation.

PREDECESSOR

Creating Design Specs, Identifying the Material Options

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	 Documents agreed upon design specifications and financial justification of the new material concept.
OPERATIONS AND ENGINEERING	 Initial assessment of potential financial implications based on package design specifications.
MARKETING/BRAND	 Marketing/Brand is the accountable party for creating the design brief, collecting and creating brand copy, coordinating with the design team and engaging with the graphics agency.
MATERIAL SUPPLIERS/ CONVERTERS	 Initial round of assessment of financial implications.
OEMS	 Initial round of assessment of financial implications.

STAGE GATE 1: DESIGN BRIEF CREATED AND APPROVED

DESIGN & DEVELOPMENT

The primary goal of the design and development phase is to create packaging that effectively protects and presents the product, while also appealing to consumers and differentiating the product from competitors.

The design stage involves developing a concept for the packaging, including considerations such as the target market, branding, and materials. The design may include graphics, color schemes, and other visual elements that align with the brand's identity and appeal to the target audience.

The development stage focuses on creating prototypes and testing them to ensure that they meet the required specifications and standards. This may include testing the durability, functionality, and usability of the packaging, as well as evaluating the visual appeal and branding effectiveness.

The packaging must also comply with any relevant regulations, such as those related to food safety or environmental sustainability. Manufacturers must consider factors such as recyclability and eco-friendliness when developing packaging materials.

- **Defining Package Parameters**
- **Lab Testing on Materials**
- **Graphic Design** - messaging and graphics to be included on the new packaging materials
- **Mock Ups/Aesthetics** - Three dimensional model/ prototype
- **Shelf Life Studies**
- **Regulatory/Compliance**
- **Confirming Design w/Brand Team**
- **Develop Equipment Supplier List**
- **Materials Application to the Machine and Machinery Usage**
- **Finalization of Material Technical Specifications**
- **Capital Expense Project Brief**






STAGE 2: DESIGN & DEVELOPMENT

DESIGN & DEVELOPMENT

Defining Package Parameters for Primary Packaging Machine

DESCRIPTION | Finalizing parameters of the primary package.






PREDECESSOR | STAGE GATE 1: Design Brief Created and Approved

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	 Receiving product information, defining the packaging and packaging material specs, and determining quality standards. Finalizing parameters of the primary package may also include establishing testing metrics (e.g., pass/fail) for potential materials.
OPERATIONS AND ENGINEERING	 Evaluation of what can and cannot be done based on past operations experience.
MARKETING/BRAND	 Confirms that the package design meets the marketing objectives.
MATERIAL SUPPLIERS/ CONVERTERS	
OEMS	

Lab Testing on Materials

DESCRIPTION | Strength of material, testing of structure/barrier properties (e.g., O₂ transmission, vapor transmission, and UV).

PREDECESSOR | Defining Package Parameters for Primary Packaging Machine

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	 Materials must pass metrics established in previous step, in order to be the final selection. If this does not happen, testing must be conducted until materials conform to established parameters.
OPERATIONS AND ENGINEERING	
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	 If packaging parameters have changed during testing or if issues arise during material trials.
OEMS	

DESIGN & DEVELOPMENT

Graphic Design

DESCRIPTION

Ensure new packaging material is able to clearly and effectively display the visual brand identity and product description and features.

PREDECESSOR

Defining Package Parameters for Primary Packaging Machine

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	● ● ● ● Consulted regarding heat exposure, pressures, etc. that the material will be exposed to within the machine and which may impact the graphics (e.g., stretch, ink bleed, etc.).
MARKETING/BRAND	● ● ● ● Provides correct branding, claim substantiation and copy for the graphic design.
MATERIAL SUPPLIERS/ CONVERTERS	● ● ● ●
OEMS	● ● ● ●

Mock Ups/Aesthetics (prototype)

DESCRIPTION

Product packaging prototype. Depending on the company, this may be a handmade or machine-built mock-up.

PREDECESSOR

Defining Package Parameters, Graphic Design

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ● Creating the prototype(s) or managing a vendor to create the prototype(s). May also serve as a test for secondary/tertiary packaging.
OPERATIONS AND ENGINEERING	● ● ● ●
MARKETING/BRAND	● ● ● ● Acts as approver of final design.
MATERIAL SUPPLIERS/ CONVERTERS	● ● ● ●
OEMS	● ● ● ●

DESIGN & DEVELOPMENT

Shelf Life Studies

DESCRIPTION

Start of the shelf life study. Process of this study may extend into the next stage due to the length of time required for the study.

PREDECESSOR

Mock Ups/Aesthetics

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R A ● ● Responsible for getting materials to proper testing.
OPERATIONS AND ENGINEERING	● ● C ● Consulted if any changes or issues occur during the shelf life studies.
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● ● ●

Regulatory/ Compliance

DESCRIPTION

Depending on your particular product, industry or region, there are a number of regulatory and compliance requirements that must be considered, such as health and safety requirements, environmental regulations, IP and advertising regulations or transportation regulations.

PREDECESSOR

Lab Testing on Material, Shelf Life Studies

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R A ● ● Supplies information to legal team on whether material selection and package design meets specific regulations to ensure compliance of final package.
OPERATIONS AND ENGINEERING	● ● C ●
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● ● ●

DESIGN & DEVELOPMENT





















Confirming Design w/Brand Team

DESCRIPTION

Will vary from company to company. Could include Focus Groups/surveys/user testing.

PREDECESSOR

Graphic Design, Mock Ups/Aesthetics, Regulatory Compliance

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	    Presenting the final package design and samples to the Brand for approval.
OPERATIONS AND ENGINEERING	   
MARKETING/BRAND	    Final approver of look and feel.
MATERIAL SUPPLIERS/ CONVERTERS	   
OEMS	   





















Develop Equipment Supplier List

DESCRIPTION

The action of defining appropriate suppliers that can form the desired packages from the selected material for the given products.

PREDECESSOR

Mock Ups/Aesthetics

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	   
OPERATIONS AND ENGINEERING	    Develop list of suppliers based on project specifications and past operations experience.
MARKETING/BRAND	   
MATERIAL SUPPLIERS/ CONVERTERS	   
OEMS	   

DESIGN & DEVELOPMENT

Materials Application to the Machine and Machinery Usage

DESCRIPTION

Matching the material with the machine and confirming compatibility/machinability.

PREDECESSOR

Defining Package Parameters, Develop Equipment Supplier List

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● C ●
OPERATIONS AND ENGINEERING	R A ● ● Evaluation of what can and cannot be done based on past operations experience.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

Finalization of Material Technical Specifications

DESCRIPTION

Finalize requirements for packaging, including, but not limited to, sealing temperature, package dimensions, and barrier properties.

PREDECESSOR

Confirming Design w/Brand Team, Materials Application to the Machine and Machinery Usage, Regulatory Compliance

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R A ● ● Issuing the technical specifications.
OPERATIONS AND ENGINEERING	● ● C ●
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	R ● ● ● Converters are responsible for providing data on physical properties of materials.
OEMS	● ● ● I OEM is informed of the materials specs the supplier will be providing (thickness, diameter, etc.).

DESIGN & DEVELOPMENT

Capital Expense Project Brief

DESCRIPTION

After project goals and packaging design have been determined, machinery requirements, implementation planning, budget information, and projected return on investment are documented.

PREDECESSOR

Finalization of Material Technical Specifications

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● C ●
OPERATIONS AND ENGINEERING	R A ● ● Creates initial CAPEX project brief, including preliminary information on capital expenditures.
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	● ● ● I
OEMS	● ● C ●

STAGE GATE 2: DESIGN SIGN OFF

PILOT

The decision is made for the project to move forward with either legacy or new equipment. This stage is essential to the project since it allows manufacturers to identify and address any potential issues with the existing equipment and/or new materials, that may arise during the full-scale production. Because the pilot stage begins with legacy equipment, each step in this stage should end with either a decision to proceed to the next step in the pilot or to abandon the pilot and move to the New Equipment Track.

- **Evaluation of Machine Capabilities**
- **Legacy Equipment Trials with New Materials**
- **Preliminary Package Handling Testing**
- **Sizing of Materials Supply (web sizing)**
- **Graphics Testing**
- **Legacy/New Equipment Decision:
Evaluating Equipment for Upgrade or Replacement**

STAGE 3: PILOT

PILOT

Evaluation of Machine Capabilities

DESCRIPTION | Process of evaluating legacy machinery based on predetermined criteria or standards, such as functionality, durability, reliability and cost effectiveness.

PREDECESSOR | STAGE GATE 2: Design Sign Off

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● C ●
OPERATIONS AND ENGINEERING	R A ● ● Operations performs comprehensive evaluation of legacy equipment, including capture and analysis of machinery performance data and assessment of specifications to confirm suitability for this particular application.
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

Legacy Equipment Trials with New Materials

DESCRIPTION | Testing equipment and new material in a real-world scenario, including set up and running of materials and collecting performance data.

PREDECESSOR | Evaluation of Machine Capabilities

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● C ●
OPERATIONS AND ENGINEERING	R A ● ● Operations performs machine testing with new materials. Metrics measuring success or failure are developed by Engineering and signed off by Operations.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

Preliminary Package Handling Testing

DESCRIPTION

Evaluation of the movement of product in and out of the equipment, using the new materials.

PREDECESSOR

Legacy Equipment Trials with New Materials

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R ● ● ●
OPERATIONS AND ENGINEERING	R A ● ● Monitoring the movement of new packaging through the line.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

Sizing of Materials Supply (web sizing)

DESCRIPTION

Adjusting the width and thickness, number of imprints, and weight of the web materials being used for packaging to ensure that it fits the machinery properly and is capable of producing the desired finished package.

PREDECESSOR

Preliminary Package Handling Testing

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R A ● ● Running tests to finalize web size of new materials. Tests can include: Web tension testing, alignment testing, thickness testing and flatness testing.
OPERATIONS AND ENGINEERING	R ● ● ● Ensures machinery is set up correctly. Responsible for running and monitoring tests and analyzing results.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

PILOT

Graphics Testing

DESCRIPTION | Evaluating the quality and accuracy of the printed graphics or labels on the new material when it is run through machinery.

PREDECESSOR | Legacy Equipment Trials with New Materials, Sizing of Materials Supply

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R A Assessing whether images are fitting correctly and that graphics meet all regulatory requirements.
OPERATIONS AND ENGINEERING	C Operations is consulted about graphics working correctly/aligned properly when new material is running on the equipment.
MARKETING/BRAND	I
MATERIAL SUPPLIERS/ CONVERTERS	C Generally consulted. Material Suppliers can become responsible when issues arise.
OEMS	

Legacy/New Equipment Decision: Evaluating Equipment for Upgrade or Replacement

DESCRIPTION | Capability study (Can the selected material be run on the equipment? Assess potential modifications to machinery, including temperature, sealing, tool change, and controls upgrades).

PREDECESSOR | Legacy Equipment Trials with New Materials, Graphics Testing

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	C
OPERATIONS AND ENGINEERING	R A Operations decides on modifications to legacy or acquisition of new equipment.
MARKETING/BRAND	C Consulted about major costs, particularly for the potential purchase for new equipment.
MATERIAL SUPPLIERS/ CONVERTERS	I
OEMS	C OEM is consulted about modifications to legacy equipment or acquisition of new equipment.

STAGE GATE 3: PILOT COMPLETION

PROCEED TO NEW EQUIPMENT TRACK OR LEGACY TRACK, AS DECIDED

LEGACY EQUIPMENT TRACK

If decision has been made to proceed with Legacy Equipment, the next 7 tasks will be the necessary path forward. If the decision has been made to acquire New Equipment, please jump to New Equipment Track.

- Evaluation of Economic Implications, TCO
- Equipment-related Procurement (Parts)
- Legacy Updates
- Packaging Line Trials with Selected Film
- Establish Preventative Maintenance
- Operations Team Training
- Hand off to Manufacturing

STAGE 4A: Legacy Equipment Track

LEGACY EQUIPMENT TRACK

Evaluation of Economic Implications, TCO

DESCRIPTION

Determining the financial implications of carrying out the project on legacy equipment, such as understanding the cost of parts and/or modifications, impact on return on investment, and impact on maintenance. Once financial implications are determined, internally, the procurement process for acquiring parts can begin.

PREDECESSOR

STAGE GATE 3: Pilot Completion

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	● ● ● ● Engineering is responsible for determining operational and engineering factors that go into calculation of TCO and other economic factors, such as ROI, payback calculations, labor calculations, etc.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● ● ●
OEMS	● ● ● ● OEM to provide quote for changes to machinery, e.g., retrofit kits, tooling, components, size parts, change parts, etc.

Equipment-related Procurement (Parts)

DESCRIPTION

Process of procuring equipment from the selected suppliers.

PREDECESSOR

Evaluation of Economic Implications, TCO

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	● ● ● ● Initiates process of procuring parts.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● ● ● Consulted on any changes in the material and the impact those changes will have on the equipment.
OEMS	● ● ● ● OEM is consulted about what may be needed with changes in material on legacy equipment.

LEGACY EQUIPMENT TRACK






Legacy Updates

DESCRIPTION

Implementation of new parts and/or modifications to the legacy equipment used in this project.

PREDECESSOR

Equipment-Related Procurement (Parts)

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Installs new parts and makes any necessary machine and ancillary equipment changes. Responsible for implementing and testing modifications, (including new wiring, new motors, cylinders, etc.) and making sure everything is operational and ready to run.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	 Converter or materials supplier is responsible for furnishing the correct package/material for the machinery to run in the package trial.
OEMS	 OEM is consulted on how to optimize during trialing.






Packaging Line Trials with Selected Film

DESCRIPTION

Upscaling from pilot size to full size on shop floor (full speed full line testing) with line speed trials.

PREDECESSOR

Legacy Updates

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Operations and Engineering establish metrics for evaluating speed trials and oversees machine performance during those trials for the purpose of determining pass/fail.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	 Converter or materials supplier is responsible for furnishing the correct package/material for the machinery to run in the package trial.
OEMS	 OEM is consulted on how to optimize during trialing.

LEGACY EQUIPMENT TRACK

Establish Preventative Maintenance

DESCRIPTION

Process of identifying types and frequency of maintenance activities required for new set up.

PREDECESSOR

Equipment- related Procurement (parts)

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	R A ● ● <p>Set up preventive maintenance routines. Update existing procedures to include required materials and tools/equipment for the new parts. Ensure maintenance SOPs are updated for the new parts/equipment and available to maintenance personnel (via plant-standard systems).</p>
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ● <p>OEM is consulted as to whether changes to maintenance will be needed with materials change, e.g., tool wear and tear and new parts/equipment.</p>

Operations Team Training

DESCRIPTION

Specialized training that develops and improves the understanding and skills of the individual(s) in the team.

PREDECESSOR

Packaging Line Trials with Selected Film

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	R A ● ● <p>Provides training in running the machinery to relevant operators of the equipment. Depending on the organization, this may include "Champion" training, where one operator is given additional training to become a subject matter expert on the machinery.</p>
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	R ● ● ● <p>OEM is responsible for training the trainer.</p>

LEGACY EQUIPMENT TRACK

Hand off to Manufacturing

DESCRIPTION	Equipment has all the necessary updates and is ready to be handed off to Operations.
PREDECESSOR	Operations Team Training

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	<div><div></div><div></div><div>C</div><div></div></div>
OPERATIONS AND ENGINEERING	<div><div>R</div><div>A</div><div></div><div></div></div> Coordinates with the production team to ensure minimal disruption during the transition to manufacturing.
MARKETING/BRAND	<div><div></div><div></div><div></div><div></div></div>
MATERIAL SUPPLIERS/ CONVERTERS	<div><div></div><div></div><div></div><div></div></div>
OEMS	<div><div></div><div></div><div></div><div></div></div>

STAGE GATE 4A: Equipment is Modified, Tested, and Ready for Commercialization

NEXT STAGE SUPPLY CHAIN AND SCALE UP

NEW EQUIPMENT TRACK

If during the Pilot Stage, the decision was made to acquire New Equipment, the next 7 tasks will be the necessary path. Capital Expense projects for new equipment have many moving parts, which will be different in each organization. The operational process for transitioning materials, represented in this document, is a small part of a larger project that is not fully detailed in this best practices.

If the decision was made to proceed with Legacy Equipment, please jump to the Legacy Equipment Track.

- Evaluation of Economic Implications, TCO
- Equipment-related Procurement (Machinery)
- Pre-FAT
- Establish Preventative Maintenance
- FAT
- Operations Team Training
- Equipment Installed and Line Testing

STAGE 4B: New Equipment Track

NEW EQUIPMENT TRACK






Evaluation of Economic Implications, TCO

DESCRIPTION

Determining the financial implications of purchasing new equipment, such as understanding the total cost of ownership, return on investment, and payback calculations. Once financial implications are determined, internally, the RFP for the new equipments should be created. The team responsible for RFP creation will vary from company to company.

PREDECESSOR

STAGE GATE 3: Pilot Completion

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Engineering is responsible for determining operational and engineering factors that go into calculation of TCO and other economic factors, such as ROI, payback calculations, labor calculations, etc.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	
OEMS	 OEMs are consulted for detailed information on cost implications.






Equipment-related Procurement (Machinery)

DESCRIPTION

Process of procuring parts and equipment after the RFP has been awarded. For full RFP best practices, please reference the 2018 OpX RFP Guidelines for CPGs.

PREDECESSOR

Evaluation of Economic Implications, TCO






Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Engineering coordinates with Procurement on machine and part acquisitions.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	
OEMS	

NEW EQUIPMENT TRACK

Pre-FAT

DESCRIPTION | Includes speed testing, safety testing, fit/form/function, etc. In many cases, the OEM provides video proof that the machinery is ready for the FAT.






PREDECESSOR | Equipment-related Procurement (Machinery)

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Receives documentation (usually video) from the OEM ensuring equipment is ready for the FAT.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	 Furnishes the correct package/material for the machinery to run in the pre-FAT.
OEMS	 Conducts and documents testing of equipment.

Establish Preventative Maintenance

DESCRIPTION | Process of identifying types and frequency of maintenance activities required for new set up.

PREDECESSOR | Pre-FAT

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Set up preventive maintenance routines. Ensure that all required materials and tools/equipment are logged into the technical stores at appropriate levels. Ensure maintenance SOPs are completed and available to maintenance personnel (via plant-standard systems).
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	
OEMS	 Specifies required preventive maintenance routines, tools/equipment, and spare parts.

NEW EQUIPMENT TRACK

FAT

DESCRIPTION

Process of testing the machinery at the manufacturer's site to ensure the equipment meets specifications in the purchase order.

PREDECESSOR

Pre-FAT

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R ● ● ● Present during FAT to ensure adherence with packaging design brief.
OPERATIONS AND ENGINEERING	R A ● ● Oversees and confirms performance of equipment, as specified.
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	R ● ● ● Converter or materials supplier is responsible for furnishing the correct package/material for the machinery to run in the FAT.
OEMS	R ● ● ● OEM is responsible for operating the equipment to ensure that everything is correctly managed and operated at the highest level to show the full capabilities of the equipment, and to demonstrate to the CPG that all safeties are in place.

Operations Team Training

DESCRIPTION

Specialized training that develops and improves the understanding and skills of the individual(s) in the team.

PREDECESSOR

FAT

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	R A ● ● Provides training in running the machinery to relevant operators of the equipment. Depending on the organization, this may include "Champion" training, where one operator is given additional training to become a subject matter expert on the machinery.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	R ● ● ● OEM is responsible for training the trainer.

NEW EQUIPMENT TRACK

Equipment Installed and Line Testing

DESCRIPTION	Installation using third parties (local contractors) at the site. I/O checks, motor turning, and other similar installation checks are conducted prior to start-up.
PREDECESSOR	Operations Team Training

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	<div><div></div><div></div><div>C</div><div></div></div>
OPERATIONS AND ENGINEERING	<div><div>R</div><div>A</div><div></div><div></div></div> Coordinates installation and line testing.
MARKETING/BRAND	<div><div></div><div></div><div></div><div>I</div></div>
MATERIAL SUPPLIERS/ CONVERTERS	<div><div></div><div></div><div></div><div></div></div>
OEMS	<div><div></div><div></div><div>C</div><div></div></div> Consulted on installation, installation checks, and pre-startup checks.

STAGE GATE 4B: Equipment is Installed, Tested, and Ready for Commercialization

NEXT STAGE CQV

CQV (COMMISSIONING, QUALIFICATION, VERIFICATION)

Commissioning, Qualification, and Verification ensures the manufacturing process is capable of consistently producing products of the desired or specified quality. CQV should include: installation, functional testing, documentation of procedures, installation qualification (IQ), operational qualification (OQ), performance qualification (PQ), and validation of critical parameters and requirements, such as process validation and cleaning validation.

- SAT
- Commissioning
- Qualification
- Verification

STAGE 5: CQV






Commissioning

DESCRIPTION

Check motor rotation and do individual machine check, including, but not limited to: safety, quality, and cleanliness.

PREDECESSOR

SAT

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Short runs validate that individual equipment/machines are meeting design rates and efficiencies. Cleaning, sanitation and safety systems are in place and functioning as designed. Corrections are made between runs until performance metrics are met.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	
OEMS	 OEM operates the equipment with operator support.






SAT

DESCRIPTION

Follows a very strict regimen of predefined tests to ensure that the FAT items are complete and that machinery is operating as designed and ready for full production.

PREDECESSOR

STAGE GATE 4B: Equipment is Installed, Tested, and Ready for Commercialization

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	
OPERATIONS AND ENGINEERING	 Testing and verifying that the equipment has been installed or set up properly and is ready to operate.
MARKETING/BRAND	
MATERIAL SUPPLIERS/ CONVERTERS	
OEMS	 OEM plays a significant role, during the SAT, in ensuring all FAT items have been completed and that the machinery performs, as intended.

Qualification

DESCRIPTION

In this step, machinery is running as a part of the line. Operators beginning to take more of a role.

PREDECESSOR

Commissioning

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● I
OPERATIONS AND ENGINEERING	R A ● ● Traditional “start-up” with longer runs; performance is tracked against a pre-defined start-up curve. Operational effects such as product change-overs and sanitation are included in the runs. Corrections are made between production runs. Operators take a more prominent role in running the system with support from OEMs. Qualification continues until the final performance criteria (rates, OEE, etc.) have been met.
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	R ● ● ●
OEMS	R ● ● ●

Verification

DESCRIPTION

Operations runs the line. Operating as a normal line with start up, shut down, changeover and meeting production targets.

PREDECESSOR

Qualification

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● ● ●
OPERATIONS AND ENGINEERING	R A ● ● Responsible for developing testing protocol that outlines the tests and inspections to ensure new equipment performs as intended. In addition to developing the protocol, Operations and Engineering conducts testing on equipment in a simulated production environment, including normal and worst-case conditions, and documents results.
MARKETING/BRAND	● ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	R ● ● ●

STAGE GATE 5: NEW EQUIPMENT IS IN FULL OPERATION

SUPPLY CHAIN SCALE UP/ COMMERCIALIZATION

Supply chain scale-up and commercialization involves expanding production capacity and establishing efficient processes to meet the demand for your product, as it transitions from implementation or upgrade of packaging machinery to full-scale production and market distribution. Throughout the scale-up and commercialization stage, close collaboration between cross-functional teams is essential to align all aspects of the business and ensure a successful market launch. Regular monitoring, evaluation, and adjustments are made to optimize processes, address challenges, and drive continuous improvement in the supply chain.

- **Materials Availability/Supply Chain/Scaling**
- **Materials Procurement**

STAGE 6: Supply Chain/Scale Up

SUPPLY CHAIN SCALE UP/COMMERCIALIZATION

Materials Availability/Supply Chain/Scaling

DESCRIPTION

Coordinating supplier resources needed for the implementation of the selected material into your packaging line. This should include coordination with suppliers and procurement, and planning inventory management.

PREDECESSOR

STAGE GATE 4A: Equipment is Modified, Tested, and Ready for Commercialization or
STAGE GATE 5: Verification Standard for New Equipment Has Been Successfully Realized

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● C ●
OPERATIONS AND ENGINEERING	R A ● ● Creates plan for implementation. Coordinates with relevant team members (procurement, suppliers) to establish specifics of plan.
MARKETING/BRAND	R ● ● ●
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● ● ●

Materials Procurement

DESCRIPTION

Process of procuring materials from the selected suppliers.

PREDECESSOR

Materials Availability/Supply Chain/Scaling

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	● ● C ●
OPERATIONS AND ENGINEERING	R A ● ● Oversees materials implementation is carried out according to plan.
MARKETING/BRAND	● ● ● I
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● ● ●

STAGE GATE 6: SUPPLY CHAIN/SCALE UP

EVALUATION

Debrief occurs for the purpose of determining whether all goals are met and if not, what actions can be taken to achieve those goals in future and current projects. The debrief also includes, but is not limited to, assessment of material usage, payback, and any other topics to evaluate the overall progress of the project.

■ Evaluation and Debrief

STAGE 7: EVALUATION

EVALUATION

Evaluation and Debrief

DESCRIPTION

OEE, payback, goals met, material usage, etc.

PREDECESSOR

STAGE GATE 6: Supply Chain/Scale Up

Team	Involvement
PACKAGE DESIGN & DEVELOPMENT	R ● ● ● Evaluates adherence to design specs.
OPERATIONS AND ENGINEERING	R ● ● ● Evaluates adherence to the project brief.
MARKETING/BRAND	● A * ● ● Assess that goals for the project are met.
MATERIAL SUPPLIERS/ CONVERTERS	● ● C ●
OEMS	● ● C ●

*Accountability for the Debrief is dependent on the owner of the project. For the purpose of simplification and consistency, the RACI matrix above reflects a Marketing/Brand driven project (see page 4)

STAGE GATE 7: COMPLETION OF MATERIAL TRANSITION PROJECT

Conclusion

Transitioning packaging materials in CPG (Consumer Packaged Goods) operations can have several benefits, including:

Cost savings:

Switching to more sustainable or lighter weight packaging materials can help reduce packaging costs, transportation costs, and ultimately, production costs. Though transitioning materials can help reduce the costs of these factors, the material itself can cost significantly more, especially if they are sustainable materials that are more compostable or recyclable.

Improved product quality and safety:

Certain packaging materials can better protect products from damage, contamination or spoilage during transit and storage, thereby ensuring better product quality and safety.

Regulatory compliance:

Some regions or countries have regulations and standards for packaging materials. Transitioning to compliant packaging can help avoid potential legal or regulatory issues.

Brand image and reputation:

Switching to sustainable or recyclable packaging materials can enhance a brand's image and reputation. Consumers are increasingly concerned about the environmental impact of the products they buy, and packaging can play a significant role in their purchasing decisions.

Environmental sustainability:

Using eco-friendly packaging materials such as biodegradable, compostable or recycled packaging can significantly reduce the environmental impact of CPG operations. This can help brands meet their sustainability goals and appeal to environmentally conscious consumers.

Innovation opportunities:

Transitioning packaging materials can also create opportunities for innovation, such as using new materials or designs that enhance the product experience or reduce waste.

Overall, transitioning packaging materials in CPG operations can bring a range of benefits, including cost savings, environmental sustainability, improved brand image and reputation, regulatory compliance, improved product quality and safety, and innovation.

Glossary

Best practice

Set of guidelines established to achieve a particular goal and can provide consistently positive results if followed.

CapEx

Capital expenditures - amount of money a company spends on acquiring or improving long-term assets

CPG

Manufacturer of Consumer Packaged Goods. Sometimes referred to as Brand Owner.

CQV

Commissioning, Qualification, Verification - verifying and ensuring all equipment and facilities are up and running for full scale production

Design & Development Stage

Second stage of a project where it involves the process of creating and developing the visual and structural aspects of the package and product. Mockups are created and testing/experiments may occur to ensure the material meets the requirements and specifications.

Dieline

A dieline shows the layout of the packaging design, including shape and size, and it shows lines where the packaging folds and where other components are located. The trial is conducted to test the structure, functionality, and design of the package before it is converted into a physical product.

Evaluation

Final stage where debrief is held regarding the overall project

FAT

Factory Acceptance Testing - Test conducted at the equipment manufacturer's facility before the equipment is shipped out to the customer. Test is to ensure the equipment meets the design specifications and functions properly.

Feasibility Stage

Initial stage of a project where the feasibility of a new packaging design/material/concept is assessed

Legacy Equipment Track

The bifurcation where the decision was made to use existing machinery.

Line Speed Trials

Trials that involve running the production line at different speeds and operating at various parameter settings to determine the optimal settings for the equipment without compromising the quality of the product or the safety of the production process.

Marketing

Marketing is considered the role that starts the project, and the ideas and initial designs come from the marketing team.

Material Suppliers/Converters

Material suppliers provide the material itself, while material converters take the material provided by the suppliers and convert, or modify the material, as necessary.

Mock Up

Prototype of the product package. Provides a realistic visualization of final product before going into production and allows designers to test and refine the packaging design to ensure all requirements are met.

New Equipment Track

The bifurcation where the decision was made to purchase new machinery.

OEE

Overall Equipment Effectiveness - standard used to measure manufacturing productivity and efficiency of equipment. Calculated by multiplying three factors: Availability, Performance, and Quality.

OEM

Original Equipment Manufacturer - OEMs produce and sell packaging machinery and equipment to other companies/customers who use it in their own packaging processes. They work closely with customers to understand their needs and provide specialized solutions through machinery.

Operations

Operations are involved with package designers to ensure package functionality, visuals, and cost-effectiveness. They are also involved in a variety of processes/activities, including procuring materials, manufacturing packaging, maintaining packaging machinery, quality control, etc.

Glossary

Optimization

Optimization under CPG operations involves optimizing OEE, scheduling, warehouse management, and other on-site requirements.

Package Design & Development

Package Design and Development are considered two distinct terms. Whereas package development focuses on all the technical aspects of the package (material, size, handling through supply chain, distribution testing, oxygen transmission through the film, etc.), package design focuses on the aesthetic aspects of the package (colors and graphics).

Pilot Stage

Third stage of a project where equipment is evaluated for an upgrade or replacement. Potential issues of the equipment and/or material are addressed.

Procurement

Process of acquiring necessary materials or equipment needed.

RACI

Also known as the responsibility assignment matrix. The RACI matrix is split into 4 categories (Responsible, Accountable, Consulted, and Informed) depending on the group's role for a particular task in the stage.

R: The **responsible** person or party is directly assigned to the task(s), which they are in charge of completing. Every task should have at least one responsible party and may have several.

A: Those who are **accountable** should make sure the responsible parties understand the tasks of the project and get them completed on time.

C: Consulted parties may not be completing the task themselves, but will provide any feedback/input on the work being conducted. Their work may become affected by the outcome of the responsible party's work.

I: Those who are **informed** are not consulted or discussed with in great detail regarding the task, but they are still kept in the loop in case the outcome of another group's work affects their work.

Retrofit

Process of upgrading or modifying an existing piece of equipment with new or improved features.

RFP

Request for Proposals - Formal document issued by a company/organization to communicate effectively to potential bidders what they want, inviting vendors to submit a proposal that outlines solutions for the company's project(s). The company/organization will then evaluate the submitted proposals and select the one that best fits their selection criteria.

SAT

Site Acceptance Testing - Test conducted on-site at the customer's facility after equipment has been installed. Test is to ensure the equipment is installed properly and functions correctly in its intended environment.

SOP

Standard operating procedure - detailed set of instructions that outlines the steps that should be completed for certain tasks or processes. In this case, SOPs refer to step-by-step instructions on conducting maintenance for machinery, equipment, facilities, etc.

Supply Chain Scale Up/Commercialization

Stage which involves expanding and increasing the capacity, efficiency, and effectiveness of the supply chain activities involved in operations. It involves scaling up various aspects of the supply chain to maintain operational efficiency and product quality, and to ensure a smooth integration of the flexible material change.

TCO

Total cost of ownership - total cost of an asset over its entire lifespan, including any ongoing expenses (maintenance, repairs, operational costs, etc.).

Vendor

Company or individual who supplies packaging materials, equipment or services to another company.



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