HACCP for Packaging Material Manufacturers- Developing a Robust Plan

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Objectives

- GFSI standards for certifying packaging materials manufacturing companies; and
- To provide basic information for building a robust HACCP plan.

Food Packaging

Packaging materials serve a variety of important functions.

- Protect food products from pathogenic microorganisms, food spoilage organisms and pests beyond manufacturing stage;
- Protect products from oxygen and moisture ingression;
- Protect the integrity of food products during storage, handling and transport (tamper evidence, counterfeit etc.);
- Provide product related information to consumers

Types of Packaging

There are three types of food packaging,

- Primary packaging
- Secondary packaging
- Tertiary packaging

A robust food safety program should take into account the potential hazards associated with all three types of packaging.

Packaging Materials and Food Safety Risks

Hazards associated with packaging materials. Example,

- Use of proper laminates in the packaging of food products to avoid migration of hazardous chemicals into food;
- Use of approved printing inks in the manufacture of packaging materials meant for food products to avoid migration of harmful substances;
- Use of approved lacquers for the interior of cans in the canning industry
- Wrong labelling of products

Food Packaging Materials and U.S. Regulations

- US Regulation

GFSI standards for Food Packaging Materials

- BRC Global Standard for Packaging and Packaging Materials, issue 5
- SQF Code, edition 7.2
- IFS PAC Secure version 1
- FSSC 22000: 2013

BRC Global Standard for Packaging- Scope

Applicable to the manufacture of packaging and packaging materials used in food packaging and filling operations .To packaging and packaging materials for cosmetics, toiletries and other consumer products and materials.

- prior operations (production of packaging materials for conversion or printing);
- operations that supply packaging materials from stock where additional product processing or repacking occurs;
- packaging manufacturers who also produce consumer disposable goods that come in contact with food (example, paper plates, drinking cups)
- manufacture and supply of other materials that are converted or semi converted and used or incorporated (example, adhesives).

BRC Packaging Standard-Product Categories

- High-Hygiene Risk: Packaging that comes in direct contact with food products (or other hygiene sensitive products). Primary packaging used for food or other hygiene sensitive products where there is no absolute barrier in place.

- Basic Hygiene Risk: Packaging for consumer products and the secondary and tertiary packaging for all uses.

SQF Code- Scope

The Code is applicable to the various sectors in the supply chain such as food production, manufacturing, storage and distribution, retailing etc. and not specific to the manufacture of packaging materials.

However, the Code has specific GMP requirements for the manufacture of packaging materials.

IFS PAC Secure- Scope

- Meant for auditing primary and secondary packaging material manufacturers and converters

- IFS PAC Secure is also applicable to non-food contact packaging materials, such as: packaging materials for cosmetics products, household products, consumer goods, hardware, etc.)

- IFS PAC Secure standard does not apply to the following activities:
  - Importation (offices, e.g. typical broker companies)
  - Transport, storage and distribution.

FSSC 22000 Standard- Scope

Intended for the audit and certification of food safety systems, which ensure the safety of products during manufacturing of:

- perishable animal products (i.e. meat, poultry, eggs, dairy and fish products)
- perishable vegetal products (i.e. packaged fresh fruits and fresh juices, preserved fruits, packaged fresh vegetables, preserved vegetables)
- products with long shelf life at ambient temperature (i.e. canned products, biscuits, snacks, oil, drinking water, beverages, pasta, flour, sugar, salt)
- (bio) chemical manufacturing (food ingredients i.e. vitamins, additives and bio cultures) but excluding technical and technological aids
- food packaging manufacturing (i.e. direct, indirect contact with the food)

FSSC 22000 Standard- Requirements

- ISO 22000:2005 (Food safety management systems —Requirements for any organization in the food chain)
- ISO 22002-4:2011 (pre-requisite program for packaging material manufacturing)
- FSSC 22000:2013 (Part 1; additional FSSC requirements)

Comparison between the Four GFSI Standards

	Criteria	BRC Global Standard for Packaging and packaging Materials, Issue 5	SQF Category 27 areas of Edition 7.2	IFS PACSecure Version 1	FSSC Category M Version 3.2
1	Scope of standard	Wide range (prior operation- conversion or printing; additional processing or re-packing; consumer disposable goods that come in contact with food; packaging materials for cosmetics, toiletries and other consumer products)	Covers only those packaging materials and packaging products that come in contact with food.	Primary and secondary food packaging materials and non-food contact applications.	Covers only those packaging materials and packaging products that come in contact with food.
2	Focus	Product safety, quality and operational criteria	Only product safety (level 2) and safety and quality (level 3)	Product safety and quality	Only product safety
3.	Packaging materials	The Packaging Standard identifies five areas of product type/field: 1. Glass manufacturing and forming 2. Paper manufacturing and conversion 3. Metal forming 4. Rigid Plastics forming 5. Flexible Plastics manufacture 6.Other manufacturing 7. Print processes 8. Chemical processes The fields are used to ensure that an auditor with the correct expertise audits the site.	Five areas of product type/field: 1. Glass 2. Paper 3. Metals 4. Plastics 5. Wood and other materials However, the field of specialization of auditors and the requirement of auditors to have expertise in the fields are not explicit and strictly enforced.	Six areas of product type/field: 1. Glass 2. Paper 3. Metals 4. Plastics 5. Wood and other materials 6. Natural packaging materials	The Packaging Standard identifies five areas of product type/field: 1. Glass 2. Paper 3. Metals 4. Plastics 5. Wood and other materials The fields are used to ensure that an auditor with the correct expertise audits the site.

Comparison between the Four GFSI Standards

4	Risk categorization of standard	Defines 2 product hygiene risk categories (high hygiene risk category for packaging intended to come into direct contact with high risk products; basic hygiene risk category is for packaging used for non-food primary packaging, such as consumer products, and secondary and tertiary packaging for all uses)	Intended for primary packaging materials.	Intended for primary and secondary packaging materials.	Intended for primary and secondary packaging materials.
5	Number of audit stages	Single stage audit	Two stage audit	Single stage audit	Two stage audit
6	Audit duration	Typically 1.5 days	Typically 1.0 day for document review and 1.5-2.0 days for the facility audit	Typically 1.5 days	Varies; Typically 1.0 day for stage 1 and 1.5-2.0 days for stage 2 audit
7	Audit Grade	Five grades, AA, A, B, C and D depending on level and number of non-conformities	Graded; Complaint (C), Good (G) and Excellent (E) depending on level and number of non-conformities	Scored, but not graded	Not graded.

Comparison between the Four GFSI Standards

9	Benefits of the standard	• Standalone Standard • Quality as well as safety and hygiene (print, process control) • Mature and well established – 2000 sites; consistent growth • Crossover with ISO standards	• Vertically integrated • Crossover with ISO standards	• Standalone Standard • Crossover with ISO standards	• Vertically integrated
10	Standard Structure	Product safety, quality and legality requirements integrated into one standard. under the following sections, • Senior Management Commitment and Continual Improvement • Hazard and Risk Management System • Product Safety and Quality Management System • Site Standards • Product and Process Control • Personnel	Module 2: Management system related requirements Module 13: Pre-requisite program requirements	Product safety, quality and legality requirements integrated into one standard. under the following sections, • Senior management responsibility • Quality and Packaging Material Safety Management • Resource Management • Planning and Production Process • Measurement, Analysis and Improvements • Packaging material defense/Food defense and external inspections:	ISO 22000:2005 Management system related requirements. ISO 22002-4:2013: Pre-requisite program requirements.
11	Accreditation	ISO 17065 Scheme	ISO 17065 Scheme	ISO 17065 Scheme	ISO 17021 Scheme

Which Standard Is Right For You?

BRC?

SQF?

IFS PAC Secure?

FSSC 22000?

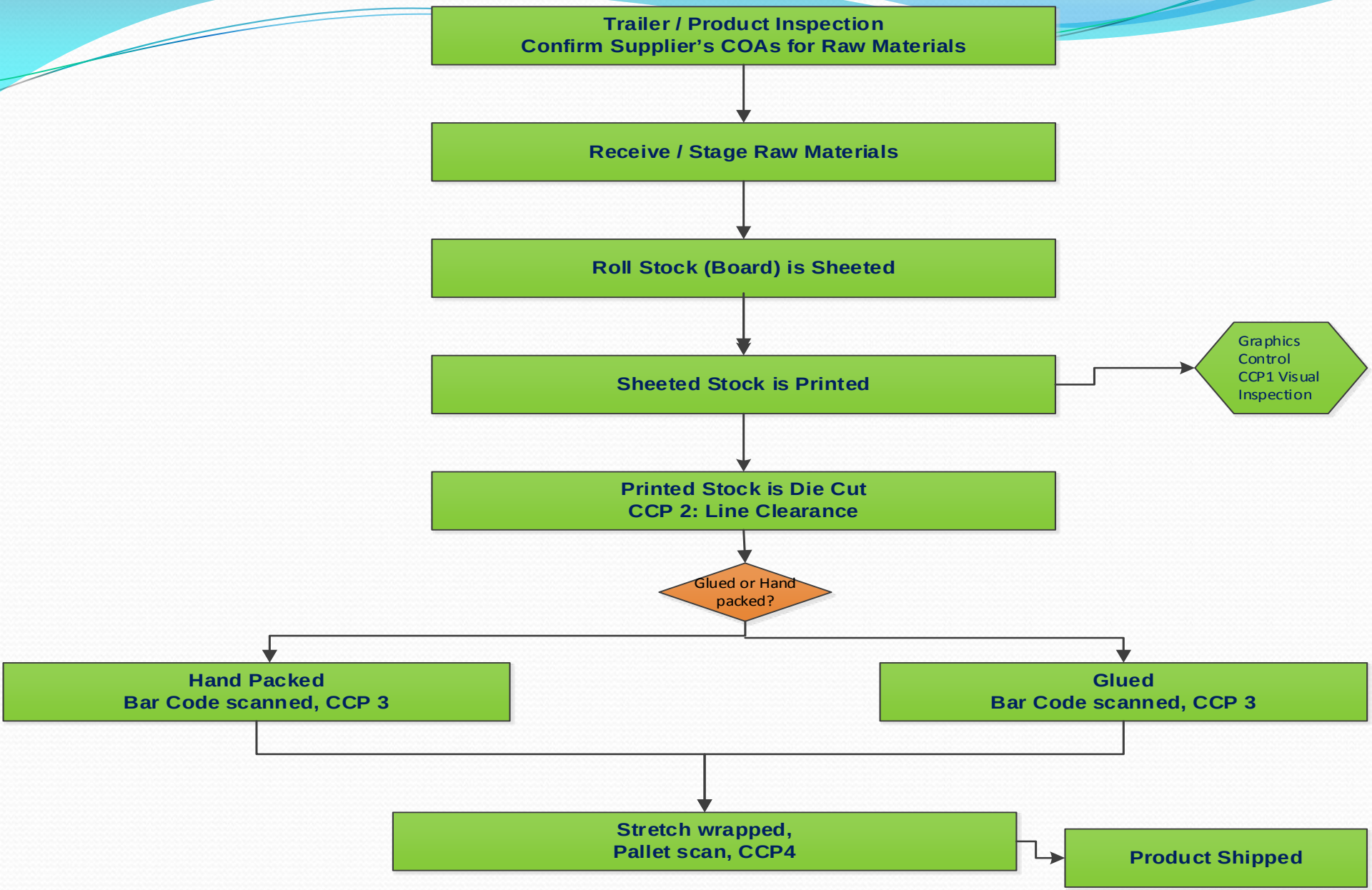
Setting up A HACCP Program

Preliminary tasks

- Assemble HACCP team
- Describe the finished product
- Identify Intended use
- Construct a process flow diagram and plant schematic
- Verify the flow diagram and plant schematic on site

Product/Product Category Description	
Facility Name:	**Date:**
Product/Product Category	Flexible Packaging
Process	Print/Adhesive Lamination/Slit of Flexible Packaging Material
Food Safety Characteristics	Direct/Indirect/Non- Food Contact. Applied labeling (if any) must be accurate to prevent/eliminate the potential for mislabeling of finished products that could lead to allergen and /or regulatory food safety labeling non-compliance. Measures must also be instituted for the prevention of introduction of foreign objects such as metal contamination.
Customer Use/Intended use	**Shredded cheese, snacks, confections**
Target Market/Consumer	Food Processors, Packaging for indirect food products.
General Raw Materials	Kraft (bleached / non bleached), Paperboard • Sulfite paperboard (bleached / non bleached), Clay-coated, recycled board, ink and coatings, glue.
Packaging/Palletization	Protective corrugated sheets, Printed paperboard packaging (recycled materials) bulk stacked with corrugated or paperboard dividers and shrink wrapped or pre-glued and case packed, stacked on corrugate dividers and stretch wrapped Pallets (e.g. wood, etc..), Labels (shipping, product, paper), (e.g., Preparation, storage needs, use by, best when used by)
Shelf Life	Depends upon end product and customer requirements. Shelf life is very dependent on storage environment. Cartons are generally warranted for manufacturability for 90 days.
Storage & Distribution	Warehousing, transportation – trucking, rail, containers, Cartons are stored in the producing facility and offsite warehouse and distributed to customer packaging plants. Materials should be stored in ambient conditions.

Flow Chart Example- HACCP for Packaging



7 Principles of HACCP

- Identify/Assess Hazards
- Establish Critical Control Points
- Establish the Critical Limits
- Establish Monitoring Procedures
- Establish Corrective Action
- Verification Procedures
- Recordkeeping

Raw Material Hazard Analysis- An example

1	2	3	4	5	6
List each raw material/ingredient in the process **(Samples listed below)**	Does this material/ ingredient INTRODUCE a potential food safety hazard? Identify here. (Be as specific as possible when listing the hazard.) C = Chemical P = Physical B = Biological	Is this hazard CONTROLLED by a Prerequisite Program or process step? If YES, identify the Program or process. If a Prerequisite Program or process is identified, do not complete Columns 4-6 and go to next process step. If NO, go to Column 4.	Is this hazard ELIMINATED by a subsequent (later) process step? If YES, this step is NOT a CCP. Identify the subsequent process step in Column 5 and proceed to the next process step. If the hazard is eliminated at this step (no subsequent elimination step) enter NO and go to Column 6 and assign a CCP number.	Identify the last process step that will eliminate the potential hazard. (Example: metal detector, filter, etc.).	**Assign a CCP number when the answer in Column 4 is NO. Otherwise leave blank.**
Paper Board	C:Oil, Grease, Solvents	Yes - COC's, Letter of Guarantee			
	P: Foreign materials	As above			
	B: --				
Printing Inks	C: Heavy Metals	Yes - COC's, Letter of Guarantee			
	C: : Off-flavor/odor	Yes-Letters of guaranty from supplier.			
	B: ---				

Process Hazard Analysis- An Example Printed Carton

1	2	3	4	5	6
List each raw material/ingredient in the process **(Samples listed below)**	Does this material/ ingredient INTRODUCE a potential food safety hazard? Identify here. (Be as specific as possible when listing the hazard.) C = Chemical P = Physical B = Biological	Is this hazard CONTROLLED by a Prerequisite Program or process step? If YES, identify the Program or process. If a Prerequisite Program or process is identified, do not complete Columns 4-6 and go to next process step. If NO, go to Column 4.	Is this hazard ELIMINATED by a subsequent (later) process step? If YES, this step is NOT a CCP. Identify the subsequent process step in Column 5 and proceed to the next process step. If the hazard is eliminated at this step (no subsequent elimination step) enter NO and go to Column 6 and assign a CCP number.	Identify the last process step that will eliminate the potential hazard. (Example: metal detector, filter, etc.).	**Assign a CCP number when the answer in Column 4 is NO. Otherwise leave blank.**
Receiving	C: ---				
	P: Foreign Material	Yes - COC's, Letter of Guarantee			
	B: --				
Sheeting	C: ---				
	P: ---				
	B: ---				
Printing	C: Error /Allergen: Mixed Cartons	No	No	Line Clearance	**CCP1**
	C: Chemical migration:	Yes-Process step: proper ink curing and solvent flashing-off, sniff test, and/or GC confirmation			
	B:				

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CCP Master Plan- An Example

CCP	Significant Hazard2	Critical Limit3	Monitoring4				Corrective Action(s)5	Verification6	Records
Graphics Control	Mixed ingredients or mixed/ wrong copy	Correct Item in Position on Printing Plate	What Approved graphics	How Overlay	Frequency Each	Who Graphics coordinator	Process stops until acceptable graphic records are received	Sign off on graphics 100% proof guarantee	**Graphic sign offs**
2b. Line Clearance	Mixed Cartons	Zero Mixed Cartons	Purge process	Line Clearance at – changeover	Every Make Ready	Printing Dept	Line shut down/mixing investigation	Sort back to last good validation	Line Clearance sheets with Supv. sign offs

HACCP Plan Validation

a. Are CCPs meaningful, measurable?

b. Have all risks been identified, evaluated?

c. Have Raw Materials changed?

d. Has process or equipment changed?

e. Documents: Reassessment Log / Change Log / History / Meeting Minutes

HACCP Plan Reassessment

The HACCP plan needs to be reassessed on an annual basis at minimum and/or when there are:

- changes to the plant;
- changes in key processing equipment;
- changes to primary raw materials;
- industry alerts concerning materials, processes, or equipment;
- industry/facility recalls;
- repeated/trended customer complaints; and, any change in any materials, processing, or equipment that would lead to challenges to the HACCP Plan Validation.

Prerequisite Programs

- The NACMCF states that prerequisite programs are "procedures including good manufacturing practices that address operational conditions providing the foundation for the HACCP system."

Prerequisite Programs

- Training
- Personnel practices
- Premises equipment and facilities
- Good Manufacturing Practices
- Cleaning, sanitation and pest control
- Receiving, transportation and storage
- Traceability and recall
- Suppler control
- Hazardous material handling

Questions?