TBS/AFDC 2(66) CD2
ICS 67:250

DRAFT TANZANIA STANDARD

Packaging materials and articles in Contact with Food – General Requirements

TANZANIA BUREAU OF STANDARDS

0. Foreword

The packaging of foodstuffs is essential for their preservation, conservation, transport, handling and sale and provides one of the best methods for the avoidance of contamination and maintaining of the hygienic conditions. There is always possibility of migration of substances of the packaging materials to the packed foods due to intimate contact. Hence, the formulation of the package must be selected to ensure that such migration is within the acceptable limit. These considerations are equally important in case of processing equipment, and utensils, which are in contact with food.

An important requirement in selecting food packaging systems is the barrier properties of the packaging material. Barrier properties include permeability of gases (such as O_2, CO_2, and N_2), water vapour, aroma compounds and light. These are vital factors for maintaining the quality of packaged foods.

In the preparation of this standard, the assistance obtained from the following publication:

US 1659:2016 Materials in contact with food — Requirements for packaging materials published by the Uganda National Bureau of Standards (UNBS)

In reporting the result of a test or analysis made in accordance with this standard, if the final values observed or calculated, is to be rounded off it shall be done in accordance with TZS 4 *Rounding off numerical values*

1. Scope

This standard provides the requirements of packaging materials and articles in contact with food and their subsequent use. This standard is expected to be a guide on the requirements of the packaging materials and articles in contact with food which are considered toxicologically safe and not on the manner of the actual processing or use

2. Normative References

The following referenced standards referred to in the text in such a way that some or all of their content constitutes requirements of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

FTZS 2929-2:2021: Glass hollowware in contact with food- Release of lead and cadmium- Part 2: Permissible limits

AFDC 2(229) CD2: Determination of specific and/ or overall migration of constituents of plastics materials and articles intended to come into contact with foodstuffs- Method of analysis

AFDC 2(231) CD2: Specification of plastic materials for food contacts application Part 3: Colorants

FTZS 2921-1:2021: Ceramic cookware in contact with food- Release of lead and cadmium- Part 1: Methods of test

FTZS 2923-2:2021 Ceramic cookware in contact with food- Release of lead and cadmium- Part 2: Permissible limits

TZS 2247 Prerequisite Programme on Food Safety-Part 4: Food Packaging Manufacturing

FTZS 2927-1:2021 Specification for plastic materials for food contact applications part 1: Polypropylene (PP)

FTZS 2927-2:2021Specification for plastic materials for food contact applications part 2: Polyethylene (PE)

FTZS 2927-4:2021 Specification for plastic materials for food contact applications part 4: Polyvinyl chloride (PVC)

FTZS 2927-5:2021 Specification plastic materials for food contacts applications Part 5: Polystyrene
FTZS 2930:2021: Rubber and plastics gloves for food services -Limits or extractable substances

3.0 Terms and definitions

For the purposes of this standard the following terms and definitions apply.

3.1 biodegradable

capable of being decomposed by the action of living organisms,

3.2 Additive

a material intentionally added to a base material to achieve a specific property such as hardener, plasticizer and preservative

3.3 contamination

all possible pollution of the finished packaging material, including microbiological, chemical and physical contaminants not intentionally added to the product and may compromise food safety.

3.4 rework material

materials intended for reprocessing

3.5 packaging materials

products that are used to wrap, cover, hold, or protect food products and are intended to come in direct or indirect contact with food. Examples include, paper wraps, wrapping materials, films, synthetic casings, nettings, trays, pouches, cartons, cardboard boxes with coated surface and bags.

3.6 migration

transfer of substances from an external source to food

3.7 overall migration limit (OML)

means the maximum permitted amounts of non-volatile substances released from a material or article into food simulants

3.8 food simulant

means a test medium imitating food; in its behavior the food simulant mimics migration from food contact materials

3.9 specific migration limit (SML)

means the maximum permitted amount of a given substance released from a material or article into food or food simulants

3.10 total specific migration limit' (SML(T))

means the maximum permitted sum of particular substances released in food or food simulants expressed as total of moiety of the substances indicated

3.11 restriction

means limitation of use of a substance or migration limit or limit of content of the substance in the material or article

3.12 specification

means composition of a substance, purity criteria for a substance, physico-chemical characteristics of a substance, details concerning the manufacturing process of a substance or further information concerning the expression of migration limits

3.13 hot-fill

means the filling of any article with a food with a temperature not exceeding 100°C at the moment of filling, after which the food cools down to 50°C or below within 60 minutes, or to 30°C or below within 150minutes.

3.14 aid to polymerization

means a substance which initiates polymerization and/or controls the formation of the macromolecular structure

3.15 active materials and articles

materials and articles that are intended to extend the shelf-life or to maintain or improve the condition of packaged food; they are designed to deliberately incorporate components that would release or absorb substances into or from the packaged food or the environment surrounding the food.

3.16 intelligent materials and articles

materials and articles which monitor the condition of packaged food or the environment surrounding the food.

3.17 leaching

is the process of extracting substances from a solid by dissolving them in a liquid.

3.**18 food grade**

Any material which is either safe for human consumption or is suitable to come in contact with food

3.**19 resin**

a solid or highly viscous substance, typically convertible into polymers.

3.20 food contact ink

an ink solely composed of substances listed as permitted for direct food contact, permitted as food or as an additive for the food that is to be packed in the packaging material which is to be printed with these inks.

3.21 certificate of analysis

document that confirms the analytical results of a product on its status of compliance to specifications or regulations.

3.22 material safety data sheet

document that contains information on the potential hazards and how to work safely with a given chemical product.

3.23 colourant

ingredients that alone or in combination with other ingredients impart or alter the colour of the product.

3.24 plastic multi-layer

means a material or article composed of two or more layers of plastic

3.25 plastic

means polymer to which additives or other substances may have been added, which is capable of functioning as a main structural component of final materials and articles

3.26 multi-material (multi-layer)

means a material or article composed of two or more layers of different types of materials, at least one of them a plastic layer;

4. Requirements for packaging materials and articles in contact with food

Packaging materials shall address safety, health, fitness for purpose, comfort and reliability, as well as such general needs as protection of the environment and energy conservation.

4.1 general requirements

4.1.1 Materials and articles, including active and intelligent materials shall be manufactured in compliance with GMP so that under normal and foreseeable condition of use, they do not transfer their constituents to foods in quantities which could:

i. Endanger human health

ii. Bring about unacceptable change in the composition of the food

iii. Bring about a deterioration in the organoleptic characteristics thereof.

4.1.2 the labelling, advertising and presentation of a material or article in contact with foods shall not mislead the consumer.

4.2 Requirement for developing packaging materials

When developing packaging materials, the requirements set out below in order of priority shall be taken into consideration.

4.2.1 Human and Environmental Safety

4.2.1.1 In storage

The packaging material shall not be potentially harmful due to:

i. Emission of substances which may endanger human or other forms of life;

ii. Contamination of the contents by the packaging, including those specific cases where the combination of packaging material and contents may cause problems.

4.2.1.2 **The contents, should not leak through the packaging due to:**

i. Lack of a seal

ii. Deterioration of the packaging caused by the outside influences, such as light or foreseeable mechanical forces

iii. Deterioration of the packaging caused by the contents

iv. Where the factors (time, temperature, light etc.) affects the safety of the product, the packaging should be clearly labeled to that effect

4.2.1.3 In Use

the packaging should not be misleading and should be clearly distinguishable, in colour and shape or by any other means, if necessary, from food or beverage packaging;

4.2.1.4 opening, or removal of contents:

i. opening instructions should be given clearly and at the appropriate place

ii. opening means should be suited to the contents, packaging and potential users.

iii. closing devices should be designed in such a way that they cannot fall inside the container

iv. the packaging should facilitate the safe removal of the contents

4.2.1.5 In Disposal

i. the packaging material shall be capable of safe disposal to human beings or the environment. Biodegradable materials are preferred.

ii. clear instructions on disposal of packaging shall be given

iii. recycling processes, if any, shall not cause harm in the short or long term to human beings or the environment.

4.2.2 Fitness for Purpose

The purpose for packaging of food is protection, handling storage and preservation

4.2.2.1 Protection

The packaging shall protect the contents in such a way that neither their performance nor their reliability is affected by:

i. outside mechanical forces such as impact or vibration;

ii. contamination by undesirable substances, for example water or air;

iii. climatic conditions, for example heat or cold.

4.2.2.2 Handling

The packaging design should facilitate:

i. transportation and storage of the product both at the distribution level and at home

ii. opening and remaining opened of the packaging when needed

iii. closing and remaining closed of the packaging when needed

iv. removal of the contents from the packaging

v. is strong enough to hold the contents when subjected to normal handling

vi. complete emptying of the packaging

4.2.2.3 Physical Dimensions

i. Neither the size nor the shape of the packaging should mislead the consumer as to the amount of its contents. Where settling may occur, this information should be clearly stated on the outside of the packaging.

ii. The number of packaging sizes should be agreed between the purchaser and supplier

> Note: For retail packaging maximum capacity shall not exceed 25kg or 20L. For bulk packaging exceeding this limit shall be provided with pallet or straps for handling and transport

iii. The packaging sizes should be suited to the end-use and to the average rate of consumption of the product

4.3 Food Composition and Packaging Choices

The choice of packaging for foods produced depends on the nature of food and storage time

4.3.1 The shelf life of food depends on:

i. The chemical make-up of the food;

ii. The environment in which the food is kept, and;

iii. The barrier properties of the packaging.

4.3.2 the choice of packaging for a food product shall depend on:

i. the chemical composition of the food;

ii. the method chosen to preserve the food, and

iii. how long the food must remain in wholesome condition (shelf life).

iv. different type of foods and the type of packaging materials preferred are shown in *Annex table 4*

4.4 active and intelligent materials and articles in contact with food.

4.4.1 requirements of active and intelligent materials to ensure safe food:

i. Food contact materials shall not endanger human health

ii. Food contact materials shall not change the composition of the food in an unacceptable way

iii. Food contact materials shall not change taste, odor, or texture of the food

iv. Food contact materials shall be manufactured according to good manufacturing practice (GMP).

v. is not altered by the ingredients of the food product in its final form.

vi. Business operators must establish a traceability system for food contact material (FCMs) from production to distribution

Note: Exemptions from the requirements 2 and 3 are made for active materials and articles

4.4.2 performance requirement for active food contact materials

i. Absorbers shall be constructed such that they absorb substances released by the food or from the atmosphere around the packaged food, e.g., oxygen scavengers that reduce the oxygen level around and, in the food, and thus prevent microbiological growth and reduce oxidation of the food.

ii. The change in the composition, odor, or taste of the food shall not mislead the consumer about the quality of the food. E.g., an absorber may not mask food spoilage and a colorant may not mask poor food quality.

iii. Information shall be provided to all operators in the food chain and to the consumer to ensure the correct application of and compliance with food legislation.

iv. The producer of the material shall provide to the food packer information on the identity of the substance used and levels released.

v. The total quantity of the released active substance in food should not exceed the maximum limit of the independent of the source from which it derives (released via packaging or added directly to the food).

4.4.3 labelling requirements for active materials and articles in contact with food

i. The food packer has to list the released substance in the list of ingredients.

ii. Labeling also has to clearly show when active or intelligent materials are used. Non edible parts of the packaging, for example, absorbing sachets in food packaging, have to be clearly labeled as non-edible.

iii. does not leak, nor allow diffusion and permeation

iv. Printing inks and/or coatings shall be food grade and conform to the requirements of the materials accepted as food additives in compliance with the relevant standards.

4.5 Flexible Films

4.5.1 Single Component Films

Single polymer films are made by extrusion, in which pellets of the polymer are melted and extruded under heat and pressure as a sheet or tube. The properties of single component flexible films are detailed in the annex table 1

The requirements for plastics materials used in contacts with food such as; Polypropylene (PP), Polystyrene (PS), Polyethylene terephthalate (PET), Polyethylene (PE) are detailed in the Tanzania standards listed in normative references (see clause 2)

4.5.2 Multiple Component Films

Multiple polymeric films are produced by combining two or more polymeric films in a number of ways:

i. Coated Films

Films should be coated with other polymers to improve specific properties for specific function (barrier properties and heat stability). Nitrocellulose is applied to one side of cellulose film to provide a moisture barrier but to maintain oxygen permeability. These films are suitable for packaging of products that have a tendency form condensation on the inside including packed: meats, bacon, and sausages.

ii. Laminated (Multi-layer) films

Lamination of two or more films improves the barrier properties, appearance and mechanical strength of flexible films. and to stop the movement of oxygen, moisture, carbon dioxide and to protect the product from light Polymer films to be laminated– shall have similar characteristics and the film tension, adhesive application and drying conditions must be accurately controlled to prevent peeling (delamination).

iii. metallised

Plastic films laminated with aluminium foil: In a multi-material or article, the composition of each plastic layer shall comply with relevant standards. The choice of laminate for specific food packaging is explained in *annex table 2*

4.5.3 Co-Extruded Films

Main groups used in co-extrusion are Olefins: Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE) and polypropylene (PP), Styrene: Polystyrene (PS) and Acro nitrile-butadiene-styrene) and Polyvinyl chloride (PVC polymers). Copolymers should have similar structures in order to be compatible. Types, properties and application of co-extrusions are detailed in *annex table 3*

4.5.4 Rubber Teats and Soothers

Nitrosamines and nitrosatable substances that can be transformed into nitrosamines in the stomach shall not be released from teats and soothers in detectable quantities as per table 1 below

Table 1: detection limit for nitrosamine and nitrosatable substances in a rubber

Extractable substances	Maximum limit (mg/kg)	Methods of analysis
nitrosamines	0.01	*TZS 2930:2021*
Nitrosatable substances	0.1	

4.5.5 plastic packaging

Plastics are available in various forms such as monofilms, co-extruded films, laminates, sachets, jars, bottles, jerry cans, trays, cups and containers of all shapes and sizes. See clause 2 for more standards on Guide on Suitability of Plastics for Food Packaging is detailed in AFDC 2 (227) CD2:

4.6 Raw material

Raw materials used in the manufacture of packaging items for food contact shall be food grade and accompanied with relevant certificates of analysis and material safety data sheets.

The manufacturer shall ensure that the raw materials are of the correct grade and are correctly labelled for food contact use. Packaging raw materials identified as prescribed shall be accepted only in clean, tamper proof containers.

4.6.1 Colourants

Colorants used in packaging materials which are to come into contact with food shall be food grade Complying to AFDC *2(231) CD2*

4.6.2 Rework materials

Rework materials used in the manufacture of packaging items for food contact use shall be prepared from raw items that have not been used or printed and have been manufactured in compliance with Good Manufacturing Practices. Post-consumer recycled material shall not be used in direct contact with food.

4.6.3 Resins

The resins selected shall be of food grade material complying to the relevant Tanzania/international standard

4.7 Additives and Processing aids

4.7.1 additives

Food contact materials and food contact additives must comply with relevant restriction conditions in relevant food safety standards.

The additives selected and their dosages shall be accepted as indirect food additives according to their prescribed conditions of use. For the mass content of any additive which exceeds 1%, the specific name or the chemical structure of the additive shall be indicated.

4.7.2 processing aids

The processing aids shall not contaminate the packaging materials during the processing

4.8 Performance of the packaging materials

the performance of the packaging material shall be identified clearly during the manufacturing and the following subjects shall at least be considered

i. the nature of the food product to be packaged
ii. the surface/volume ratio
iii. the expected maximum shelf-life of the food product

iv. the filling, sealing and storage methods to be used
v. the heating, cooling, sterilization and pasteurization processes to which the packaging material and contents may be exposed

The required performance shall, wherever possible, be translated into technical specifications such as permeability, mechanical strength, barrier properties and specific organoleptic tests to be performed

4.9 Overall Migration Limit (OML)

The maximum OMLs for plastic food contact materials and articles shall be as indicated in table 2 below

Table 2: overall migration limit of food contact material and articles

Type of food contact material (FCMs)	maximum limit	Test Method
For general plastic FCMs	10 mg/dm^2	AFDC 2(229) CD2
For FCMs for infants and young children	60 mg/kg	

Note: OML only measures the inertness of FCM. It is not a safety limit.

4.10 Specific Migration Limit (SML) and SMLT

The maximum migration of heavy elements from plastics material in contact with food shall not exceed the limit tabulated below.

Table 3: maximum limits of heavy elements in plastic materials for contact with food.

Heavy elements	Percent by mass (max limits)	Test Method
Barium	0.01	AFDC 2 (229) CD2
Lead	0.01	
Arsenic	0.05	
Mercury	0.05	
Cadmium	0.10	
Zinc	0.2	
Selenium	0.01	

Chromium	0.025	
Antimony	0.025	
Total aromatic by amine	0.05	

4.11 glass materials in contact with food

Safety requirements of glass materials in contact with food are detailed in FTZS 2929-2:2021

4.12 ceramic packaging and articles in contact with food

Ceramic articles shall be accompanied by a declaration of compliance indicating the manufacturer and importer, if any, as well as the conformity to the limits for lead and cadmium specified in *FTZS 2923-2:2021*

5.0 Hygiene and Good Manufacturing Practice (GMP)

5.1 GMP

GMP shall be applied at all stages of production of food contact materials and articles and in all sectors. Excluded are the stages of production of starting substances and raw materials.

5.2 Hygiene

Food grade packaging materials shall be produced and handled in hygienic manner in accordance with TZS 2247 to prevent contamination putting into consideration that most packaging items may not be sterilized before use.

6. sampling and methods of test

Sampling and test method should be done as prescribed in the standard for the specific packaging materials

7.0 packing, marking and Labeling

7.1 packing

The packaging material shall be suitably packed with suitable liner in a container as agreed between the purchaser and the supplier, in a manner so as to ensure that the items do not become contaminated during transport and storage.

The contents of each package shall be uniform and contain only Packaging items of the same origin, quality, and size (if sized).

7.2 marking and labeling

Each pack shall be labeled in accordance with the requirements and the following particulars shall be clearly and indelibly marked on each container; printing ink if any shall be non-toxic and non-transferable:

i. name of the packaging material
ii. name and physical address of manufacturer and/or distributor
iii. type of food suitable for the packaging
iv. temperature at which the food should be packaged

v. net weight or length in metric units
vi. lot identification (batch number)
vii. Storage conditions
viii. Words “for food contact use” or the following symbol shall appear on the labelling

Figure 1

Note: When labelling non-retail packages, information for non-retail packages shall either be given on the packages or in accompanying documents, except that the name of the produce, lot identification and the name and address of the manufacturer or packer shall appear on the package.

7.3 The containers may also be marked with the TBS Standards Mark of Quality.

NOTE- The TBS Standards Mark of Quality may be used by the manufacturers only under licence from TBS. Particulars of conditions under which the licences are granted, may be obtained from TBS

Annexes: Tables

Table 1. Selected Properties of Single Component Flexible Films

Film	Moisture vapour transmission rate	Oxygen transmission rate	Carbon dioxide transmission rate	Tensile strength	Light transmission	Sealing temperature
	mL m^{-2} per 24h 25°C	mL m^{-2} per 24h 25°C	mL m^{-2} per 24h 25°C	MN m^{-2} Machine Direction	%	°C
Cellulose						
Uncoated	Moderate	Good	moderate	Moderate	Trans	
Nitrocellulose coated	Good	Good	Good	Moderate	Trans	90-130
Polyvinilidine Chloride (PVDC)	Good	Good	Good	Moderate	Trans	100-130
Metallised PVDC –coated	Excellent	Excellent	Good	Good	Opaque	90-130
Polyethylene						
Low density	Poor	Poor	Poor	Good	Trans	117-121
High density	Moderate	Poor	Poor	Moderate	Moderate	135-170
Polypropylene						
Oriented	Excellent	Poor	Poor	Good	trans	145
Biaxially oriented	Excellent	Poor	Moderate	Moderate	Trans	117-124
PVDC – coated	Excellent	Good	Good	Good	Trans	
Metallised	Excellent	Good	Moderate	Good	Opaque	120-145
Polyester						
Plain	Excellent	Modeate	Poor	Moderate	Moderate	100-200
Metallised	Negligible	Good	Negligible	Moderate	Opaque	100-200
PVDC-coated and metallised	Excellent	Excellent	Excellent	Good	Opaque	
Polyvinylidene chloride	Good	Excellent	Good	Good	Good	100-160

Table 2. Selected Laminated Films Used for Food Packaging

Laminate	Typical Food Application
Polyvinylidene chloride-coated polypropylene-metallized-polyvinylidene-coated polypropylene	Crisps, snack-foods, ice-cream, biscuits confectionery
Polyvinylidine-chloride-coated polypropylene-polyethylene	Bakery products, cheese confectionery dried fruit frozen vegetables
Polypropylene-ethylenevinyl-Acetate	Modified atmosphere fruits, small goods (cured meats)
Biaxially oriented polypropylene Nylon-polythene	Retort pouches
Cellulose-polythene-cellulose	Pies, crusty bread, cooked meats and cheese
Cellulose acetate-paper-foil- Polypropylene	Dried soup mixes instant noodles
Metallised-polyester-polyethylene	Coffee, milk powder, bag in the box packaging
Polyethylene terephthalate-aluminium – polypropylene	Soft retort pouches
Polyethylene nylon	Vacuum packs for bulk fresh meat (cryo-vac).
Nylon-polyvinylidene chloride Polyethylene-aluminium-polyethylene	Boil in the bag products
Nylon-medium-density-ethylene butane copolymer	Boil in the bag products

Table 3 Selected Applications of Formable Flat Sheet Co-extrusions

Type of Co-extrusion	Properties	Application
High impact polystyrene polyethylene terephthalate	Ultra violet and odour barrier	Rigid butter, bulk 20 litre containers margarine containers
Polystyrene-polystyrene-polyvinylidene-polystyrene	Ultra violet light and odour barrier	Juices, milk meat containers
Polystyrene-polyvinylidene-polyvinylidene chloride-polyethylene	Ultra violet and odour barrier	Squeezeable sauce bottles Vinegar
Polypropylene-saran-Polypropylene	Retortable trays	Ready to heat composite meals
Polystyrene-ethylene-vinyl Acetate-polypropylene	Modified atmosphere packs	Meats, small goods and fruits

Table 4: Packaging Materials for Food Products:

S/NO	FOOD PRODUCT	PACKAGING MATERIALS
	I PACKAGING OF MILK AND MILK PRODUCTS	
1.	Flavoured milk	
	a) Pasteurized flavoured milk	• Glass bottles • LDPE lined cartons • Aseptic cartons
	b) Sterilized flavoured milk	• Sanitary cans Glass bottles • Poly-paper or Poly-laminated paper packs in tetrahedron, pyramid or other forms
2.	Sterilized milk	• Glass bottles • Sanitary cans • Poly-paper or poly-laminated paper packs in tetrahedron, pyramid or other forms
3.	Condensed milk sterilized cream	• Hermetically sealed containers • LDPE lined cartons • Aseptic cartons
4.	Fermented milk products and dahi	• Glass bottles or any other suitable containers and capped
5.	Channa, khoa, cheese, chakka and shrikhand	• Bi-axially oriented nylon film (BONF) /EVA BONF/IONOMER BOPP/EVA • Metal cans coated with a suitable lacquer.
6.	Partly skimmed sour milk powder sweet-cream, buttermilk powder and casein	• Kraft paper • Gunny bags with plastic liners
7.	Burfi	• Paper-board container • Barrier laminates like BOPP/LDPE • Tinplate containers having inner lining of parchment paper • Board carton lined on the inside with fat and moisture proof parchment paper
8	Ice-cream	• Returnable containers (not for retail sale) • Mild steel tinned • Aluminium or stainless steel • Non-returnable Containers • Paper-board • Metallic foil • Paper board containers shall be made water-resistant by coating or impregnation with wax or resin. • Sterilized and wrapped spoons shall be supplied with small non-returnable containers
	a) Dried Ice – Cream Mix	•Hermetically sealed and clean tinplate containers
9.	Canned rasgulla	• Open top sterilized sanitary cans • Polystyrene tubs
10.	Milk powder, malted milk and skim milk foods, vegetable protein infant food with milk, infant milk foods and processed cereal weaning foods	• Hermetically sealed and clean tinplate containers • Bag in box having inner layers made of PET / LDPE.
	II PACKAGING OF SUGAR AND HONEY	
1.	Sugar	

	a) Vacuum Pan Sugar, Refined Sugar, Raw Sugar, white sugar and Sugar Used in food Preservation Industry	• Polyethylene coated hessian hags • Polyethylene coated raffia bags • A-twill jute bags
	b) Cube Sugar	• Wrapped together in butter paper or kraft paper and packed in cartons. • LDPE coated poster paper
	c) Icing Sugar	Hermetically sealed tin containers • Polyethylene bags packed in cartons • LDPE coated poster pouches
2.	Honey	• Wide mouth glass containers • Acid-resistant lacquered tin containers
III PACKAGING OF EDIBLE STARCHES AND STARCH PRODUCTS		
1.	Flours and Starches (Maize, Tapioca Arrowroot)	• LDPE coated jute bags • LDPE coated raffia bags • A-twill jute bags
2.	Makhana Products	• Suitable moisture proof containers
3.	Tapioca Chips and Sago	A-twill jute bags or LDPE coated jute bags • LDPE coated raffia bags
4.	Custard Powder	• Flexible pouches made from PET/LDPE, poster paper/LDPE, glassine etc.
5.	Liquid Glucose	• Drums, lined with PET/LDPE bags or lacquered • Lined steel drums or those made of tin-plate
6.	Dextrose Monohydrate	• High density polyethylene (HDPE) bags • Hessian or textile bags - paper, polyethylene or cotton lined • Multi-walled paper bags • Lined corrugated fibre-board containers • Solid fibre-board containers • Lever lid tinplate containers
7.	Edible Spray Dried Potato Flour	• Tin containers • HDPE or metallised polyester containers or bags • Pouches made from flexible laminates, such as, BOPP/LDPE
IV PACKAGING OF FOOD GRAINS AND FOODGRAIN PRODUCTS		
1.	Cereal Grains a) Pearl Barley	• LDPE coated jute bags • Raffia bags • Double jute bags Inner one of which shall be new A-twill • Air-tight containers made of tinplate • LDPE coated jute bags and raffia bags
2	Cereal Flours a) Barley Powder	• LDPE coated jute bags/LDPE coated raffia bags • B-twill jute bags • DW-flour bags • Polyethylene lined jute bags • Air-tight tinplate containers or any other suitable air-tight containers • LDPE coated paper bags and pouches
3.	Besan	• Paper • Cloth • Polyethylene or polyethylene laminated jute bags
4.	Miscellaneous	

	a) Malt Extract	• Air-tight containers made of galvanized iron • Glass or any other suitable material • Bag-in-box system
	b) Barley Malt	• Polyethylene lined gunny bags • Bag-in-box system
	c) Corn Flakes	• HDPE bags made of 300-gauge HDPE and properly sealed • LDPE lined cartons
	d) Rolled Oats	• Air-tight containers made of tinplate • LDPE lined cartons
	e) Macaroni, Spaghetti and Vermicelli	• Card board cartons with a lining of moisture-proof material or plastic film • Moisture-proof paper bags • Pouches made from PET/LDPE, BOPP/LDPE
5.	Papad	• Pouches made from PET/LDPE and BOPP/LDPE• Pouches made from PET/LDPE and BOPP/LDPE
V PACKAGING OF BAKERY AND CONFECTIONERY PRODUCTS		
1.	Bread	• In sliced form in LDPE coated poster paper or clean waxed paper • Grease-proof paper
2.	Biscuits	• Containers made of tinplate • PCRC sheets • Card board paper • Cello / LDPE • BOPP / LDPE • PET / LDPE • Paper / LDPE • Foil / LDPE
3.	Confectionery	• Cellulose film waxed paper or foil • Polyethylene • Cello / LDPE • BOPP / LDPE • PET / LDPE • Paper / LDPE • Foil / LDPE
4.	Ice – cream Cones	• Containers made of card board paper or any other suitable material
5.	Bread Rusks	Containers made of: • Tinplate • Cardboard • Paper
6	Buns	• Suitable non-toxic wrapper
7.	Bombay Halwa	• Hermetically sealed tinplate containers suitably lacquered • Glassine / LDPE
8.	Peanut Candy	• Cellulose film • Aluminium foil • Wax paper • Polyethylene or other flexible packaging materials
9.	Desiccated Coconut	• LDPE bags of about 50µ thickness • Pouches made from PET/LDPE or BONF/LDPE
10.	Baking Powder	• Air-tight containers • Flexible packaging materials, such as, PET/LDPE and BONF/LDPE

11.	Cakes	• Waxed paper • Glassine/LDPE • Tins • Grease-proof polyethylene
12.	Self-Raising Flour	• Jute bags • Paper bags with polyethylene lining • Polyethylene bags
	VI PACKAGING OF PROTEIN-RICH FOODS	
1.	Protein Rich Flours and Concentrates a) Edible Leaf Protein concentrates	• Polyethylene lined jute bags or paper bags • Clean tinplate containers • Sealed metal containers • Double polyethylene lined paper bags • Multi-walled bags
2.	Fish Protein Concentrates	• Grease-proof or sulphate paper • Cellulose paper or any other non-toxic packing materials which may be covered with moisture-proof laminate or coated paper • Air-tight Metallic containers
3.	Roasted Groundnut (Peanut) Kernels	• Flexible food grade pouches • Sealed containers
4.	Ready-to-Eat, Protein-Rich Extruded Foods	• Moisture-proof paper bags (multi layered, polyethylene lined) • Pouches made from BOPP/ LDPE, Glassine/LDPE • High density polyethylene woven bags having 300gauge LDPE liner for bulk • 250-gauge high density polyethylene bags
5.	Protein Chewy Candy	• Cellulose film • Waxed paper • Foil • Polyethylene or other flexible packaging pouches • BOPP/LDPE • Glassine/LDPE
6.	Sunflower Seed Grits	• Bag-in-box system
7.	Reconstitutable Protein Beverage Food	• Tin-plate containers • Glass-bottles hermetically sealed • Bag-in-box system
8.	Peanut Butter	• Wide-mouth glass jars • Polystyrene tubs
9.	Vegetable Protein Based Yogurt (Vegetable Curds)	• Wide-mouth glass jars • Polystyrene tubs • Plastic or paper containers
10.	Protein Fortified Bread	• LDPE coated poster paper • Waxed paper • Grease-proof paper
11.	Protein-Rich Concentrated Nutrient Supplementary Foods and Food Supplements for Infants	• Moisture-proof, clean, dry and sound containers • Pouches made from sterilizable flexible laminates
12.	High Protein Mixes for Use as Food Supplements	• Tinplate containers or cardboard paper containers • Pouches made from sterilizable flexible laminates
13.	Protein Based Beverages	• Glass bottles • Lined cartons • Glass bottles or sanitary cans

14.	Protein-rich Biscuits	• Tinplate containers made of PCRC sheets or cardboard paper containers • Grease-proof sulphite paper, cellulose film • Cello/LDPE • PET/LDPE • BOPP/LDPE
VII PACKAGING OF SPICES AND CONDIMENTS		
1.	Whole Spices	• Jute, cloth, paper or polyethylene bags • LDPE coated jute bags • LDPE coated raffia bags • Double gunny bags
	a) Black Pepper, Whole	• Jute bags with or without moisture-proof lining • LDPE coated raffia bags
	b) Cardamoms	• Tinplate or wooden cases, lined with polyethylene or water–proof or kraft paper • Jute bags lined with polyethylene • LDPE coated raffia bags
2.	Ground Spices	• Paper bags • Bags made of suitable barrier films / laminates, such as PET/LDPE, PET / EVA, BOPP/EVA
3	Miscellaneous	
	a) Ginger, Whole	• Double or single jute bags with water-proof lining • LDPE coated raffia bags
	b) Ginger, Ground	• Tin-plate or glass containers • Paper cartons properly lined with water-proof paper • Bags or pouches made from PET/EVA or BOPP/EVA
	c) Curry Powder	• Tin-plate or glass containers, paper cartons properly lined with water-proof paper • Bags or pouches made from PET/EVA or BOPP/EVA
	d) Chilies	• Jute bags • Pouches made from PET / EVA or BOPP / EVA • LDPE coated raffia bags
	e) Dehydrated Onion and Garlic	• Large bags made from PET/LDPE • BOPP/LDPE or in HDPE woven bags
	f) Saffron	• PET / LDPE or BOPP/LDPE
	g) Black Pepper and Ginger Oleoresin and Oleoresin Chillies	• Glass containers • Pure aluminium containers • Tin containers or containers of high-density polyethylene (food grade) • Bag-in-box system
	h) Tamarind Concentrate and Tamarind Pulp	• Tin or glass containers • Pouches made from metallised polyester or laminate of metallized BOPP/ionomer • Metallized PET bags or BOPP ionomer bags • Closely woven bamboo baskets, lined with polyethylene or palmyra mat • Jute bags, lined with polyethylene • LDPE coated raffia bags • Wooden boxes lined with palmyra mats
	i) Dehydrated Green Pepper	• Tin or glass containers • Paper cartons lined with water-proof paper • Jute bags with or without moisture-proof lining • PET/LDPE bags
	j) Cloves	• Air-tight containers

		• PET/LDPE bags
VIII PACKAGING OF FRUITS AND VEGETABLES		
1.	Raw Vegetables and Fruits	• Loosely woven gunny bags • Wooden / plastic crates • Lined or unlined corrugated boxes
	a) Onion and Garlic	• Loosely woven gunny bags • Net bags, bamboo baskets or palm leaf baskets • Wooden crates, lined or unlined corrugates boxes
	b) Tomatoes	• Baskets or wooden boxes • Lined or unlined corrugated boxes
	c) Peas-in-Pods	• Loosely woven gunny bags • Baskets or corrugated boxes, lined or unlined
	d) Chilies	• Gunny bags • Bamboo baskets • Corrugated boxes, lined or unlined
	e) Guavas, Limes and Mandarins	• Wooden boxes, lined or unlined corrugated boxes • Individually wrapped either in tissue paper or any other suitable material
2.	Canned Vegetables and Fruits	• Open top sanitary cans-Lacquered internally and hermetically sealed
3.	Dehydrated Vegetables	• Containers made of tinplate • Laminated foil bags • Metallized BOPP/LDPE bags
4.	Juices, Jams, Jellies and Marmalades	• Glass bottles or open top cans
5.	Miscellaneous	
	a) Synthetics and Fruit Squashes	• Glass containers • Containers made from suitable plastic materials, such as, PET
	b) Tomato Ketchup	• Glass containers, jars • Plastic containers made of PET
	c) Pickles	• Glass container • Wooden barrels • Metal containers • Large pouches made from PET-PET/ ionomer • Suitable flexible packaging material as PET and food grade PVC
	d) Mango Chutney	• Wooden barrels • Glass containers • Pouches made from metallized PET/ionomer
	e) Papain	• Polyethylene bags • Metallized polyester/ionomer pouches
	f) Walnuts	• B-twill jute bags • LDPE coated jute raffia bags
	g) Cashew Kernels	• Leak-proof containers • LDPE coated jute raffia bags
IX PACKAGING OF STIMULANT FOODS		
1.	Tea	• Flexible packaging materials • Laminates, such as, LDPE, paper coated LDPE • PET / LDPE • BOPP / LDPE
2.	Roasted and Ground Coffee	• Tin-plate • Glass • Plastic films or foil

		• Laminated pouches of paper/LDPE • PET/LDPE • BOPP/LDPE
3.	Soluble Coffee Chicory and Soluble Coffee Powder	• Tin-plate or glass container • Flexible laminated pouches of paper/LDPE • PET/LDPE • BOPP/LDPE
4.	Cocoa, Roasted chicory, Roasted Coffee Chicory Powder, Drinking Chocolate	• Suitably lined containers • Flexible laminated pouches of paper/LDPE, Foil/LDPE, PET/LDPE
5.	Chocolates	• Tinplate • Plastic, grease-proof paper • Aluminium foil • Laminates made of paper/LDPE, BOPP / LDPE
6	Cocoa Butter	• Well closed containers • Polystyrene tubs
7	Cocoa Beans	• LDPE coated jute raffia bags
X PACKAGING OF ALCOHOLIC DRINKS AND CARBONATED BEVERAGES		
1.	Carbonated Beverages	• Glass containers • Cans, plastic containers and dispensing units
2.	Vodka, Gin, Country Spirit (Distilled), Table Wines, Brandies Whiskies and Rums	• Glass liquor bottle • Glass bottles of any suitable capacity • PET bottle lass liquor bottle
3.	Beer	• Glass bottles • PET bottles
4.	Toddy	• PET and PVC bottles
XI PACKAGING OF MEAT, FISH AND POULTRY		
1.	Fish and Fisheries Products a) Fresh Products	
	a_1) Pomfret and Threadfin	• Containers, made of either plywood, Country wood or plastic • Polyethylene lined insulated boxes
	a_2) Mackerel and Sardines	• Suitable containers of sufficient strength • Polyethylene lined insulated boxes
	a_3) Seer fish	• Polyethylene lined insulated boxes Polyethylene lined deal wood boxes
	b) Frozen Products	
	b_1) Prawns	• Polyethylene lined insulated LDPE coated cartons • LDPE bags
	b_2) Frog legs and Lobster trils	• Plywood or deal wood cases • Cardboard cartons
	b_3) Pomfret, threadfin, mackerel seer fish, sardines	• Suitable containers which can withstand the stress and strain
	b_4) Cuttlefish and squid	• The fillets of uniform sizes should be laid flat in the specific carton with a polyethylene lining • Fillets of uniform size shall be rolled loosely in torpedo shape and laid in layers in the selected carton which shall be covered by polyethylene sheet • The frozen fillets of cuttlefish or tubes of squid may be packed inside a polyethylene pouch of suitable size or wrapped with polyethylene film
	c) Canned Products	• Internally and uniformly lacquered cans

2.	Meat and Meat Products a) Meat (Fresh, Chilled)	
	a_1) Packaging of meat including whole carcasses for local market	• Wrapped in polyethylene sheets or bags • Wrapping material like BONF/LDPE • PET/LDPE
	a_2) Packaging of meat for distant markets	• Polyethylene sheets • Suitable wrapping material like BONF /LDPE or PET / LDPE (vacuum packed)
	a_3) Packing of whole frozen carcasses for distant market	• Wrapped first in hosiery or linen cloth, then in kraft paper or Polyethylene film and finally in hessian cloth
	b) Meat Products	
	b_1) Fresh sausages	• Polyethylene bags • Butter paper and then in kraft paper • Wrapping material, such as, BONF/LDPE, PET/LDPE
	b_2) Cooked meat products	• Wrapped in butter paper and then put in big polyethylene cover • Wrapping materials such as, BONF/ LDPE, PET/LDPE
	b_3) Smoked ham or bacon	• Wrapped in grease-proof cellophane material or butter paper
	c) Canned Meat Products	
	c_1) Pork luncheon meat and pork sausages	• Each can should be coated on the inner side with edible gelatin, lard or lined with vegetable parchment paper
	c_2) Ham, mutton and goat meat curried and in brine	Open top sanitary cans, hermatically sealed
	d) Poultry and Poultry Products	
	d_1) Dressed Chicken	• Polyethylene bags (50µ)
	d_2) Chicken Essence	• Hermetically sealed ampoules
	d_3) Egg Powder	• Tinplate containers • Flexible pouches of PET / LDPE
XII PACKAGING OF OIL AND FAT		
1.	Oil	• Tinplate containers • Glass bottles • Rigid plastic containers of HDPE, food grade PVC, PET • Flexible pouches made of plastic film / foil / laminate • Flexible pouches of BONF/ionomer and co-extruded nylon/ionomer.
2.	Fat (vanaspati, bakery shortening, etc.)	• Flexible packs • Tin containers