



PACKAGING GUIDE

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INTRODUCTION

One of Rio 2016TM main objectives is to follow the hierarchy of reduce, reuse and recycle in all of its preparations and operations.



It is therefore crucial to apply the same principle to all packaging as it can contribute significantly to the overall waste volumes.

Primary, secondary and tertiary packaging use must comply with the guidelines defined by the National Policy on Solid Waste (Política Nacional de Resíduos Sólidos - PNRS in Portuguese) that also establishes the material and packaging management action hierarchy of: avoid, reduce, reuse, recycle, incinerate with energy recovery and, lastly, perform solid waste treatment and the appropriate final disposal of rejects.

WHAT IS PACKAGING?

Packaging is a practical, financially viable and safe way to protect, contain and present goods to society in the transport, storage, delivery and use stages, from raw materials to processed products. However, packaging may be severely harmful to the environment during its whole life cycle.

During production, packaging follows many legal and technical requirements that must be met. These are mainly aimed at protecting the product as well as the distribution, sales and use viability.

It is important to adjust packaging to the product and select its material, taking the necessary protection into consideration. Product's fragility may be measured through tests, with the use of shock, vibration and pressure equipment and its result

allows for determining package protection levels. The less control a company has on the physical environment, the more packaging precautions it must have in order to avoid damages. Therefore, the logistic environment influences package project-related decisions.

Whenever requested by Rio 2016™, suppliers and licensees must provide any necessary information relating to the primary, secondary or tertiary packages used or supplied.

TYPES OF PACKAGING

According to use:

Rio 2016™ understands packaging definition to include the following:

Primary packaging (or sales packaging): any package that is in direct contact with the product and that has direct contact with the final consumer at the point of purchase.

Secondary packaging (or grouped packaging): Any package aimed at grouping together a certain number of sales units, with the product's characteristics not being altered once removed from the package.

Tertiary packaging (or transport packaging): Any type of package aimed at facilitating secondary and/or primary packaging logistics, contributing to the transported goods not to be harmed. Containers for road, rail, sea and air transport are not considered part of tertiary packaging.

According to temporary disposal:

Packages may be produced taking into consideration the following disposal options after their first use:

Disposable packaging: it will be discarded after first use. It may have a simpler structure, using fewer raw materials in its formulation and consuming less energy for its processing.

Returnable packaging: it will return to the product's manufacturing process for repackaging, going through washing and sterilisation processes as well as reverse

transport and logistics stages. It is important to ensure the optimisation of each process and stage.

Reusable packaging: it will be reused by the consumer to pack other products and must be adapted for the reuse to be possible without harming consumer's health and safety.

According to final disposal:

Packages may be produced taking into consideration the following final disposal options:

Recyclable packaging: the raw materials used for producing the packaging may be reused after use. This normally involved the materials going through a chemical or physical transformation.

Biodegradable packaging (non-compostable): the package can be degraded in the presence of microorganisms that release CO₂ into the atmosphere under certain heat, humidity and oxygen conditions. This type of packaging is not transformed into a new product.

Biodegradable compostable packaging (or organic recycling): it is a specific type of biodegradable package that may be intended for the composting of organic waste. The result of the composting process may be used as fertiliser for plants and trees in general. The process requires a safe and controlled environment (aerobic or anaerobic treatment, with stabilised organic waste or methane production). Sanitary landfills are not a recognised form of organic recycling.

“Non-biodegradable” packaging: packaging that does not degrade naturally or whose degradation process takes longer than 10 years (plastics: from 10 to 400 years; metals: from 50 to 200 years; glass: undetermined).

Irresponsible packaging disposal may compromise its recycling or biodegrading quality, making it as harmful as “non-biodegradable” packaging.

Rio 2016™ will give preference to recyclable and biodegradable compostable packaging. The use of non-biodegradable or biodegradable non-compostable packaging is restricted.

CRITERIA AND REQUIREMENTS

Life cycle

Rio 2016™ encourages the verification of each life cycle stage and its possible environmental impacts. In this context, it is important to ensure that, whenever a certain life cycle stage is improved, there are no negative environmental impacts in other stages.

Among the environmental criteria that might be taken into consideration through life cycle analysis are:

- Reduction of packages' mass or volume
- Improvement of energetic efficiency in the manufacturing process
- Optimisation of its production process
- Improvement of product's life
- Choice of raw materials with a lesser environmental impact, compatible with recycling processes.

Environmental labelling

The adoption of type II environmental labelling (self-declared environmental claims) is mandatory, according to ISO 14021, so that the best way of dealing with packages after use is always clearly indicated.

The adoption of type I environmental labelling (ecolabels) is desirable by Rio 2016™. Any exception to these rules must be previously justified by the supplier or licensee and approved by Rio 2016™.

For further clarifications on environmental labelling types, please refer to Annex 1.

Ecodesign

Rio 2016™ understands that the use of materials during manufacturing must be minimised, as well as its environmental impacts on distribution and disposal stages.

It is desirable that every package is produced in compliance with ecodesign principles, according to the ISO 14062 norm (Integrating Environmental Aspects into Product Design and Development).

Raw materials, energy and water reductions can be implemented without detrimental effects to package performance. The ISO 14062 norm stimulates the prioritisation of packaging projects that include reuse, dismantling, recycling and incineration with energy recovery which reduce pollution generation at source and avoid dangerous or toxic substances. For further details on this last point, please refer to the Rio 2016™ Guide on Hazardous Substances and Materials.

Ecodesign aims for the sustainable and optimised use of natural resources through the development of packages, which take into account significant environmental impacts, mitigation, renewable and/or environmentally appropriate resources use (such as recycled materials), generated waste reduction and recycling as well as the reduction of environmental damage that may be caused by product misuse, with due attention to the life cycle of good and services.

Ecodesign also prioritises the combination of materials that are compatible in their recycling process (such as biodegradable compostable paper packages with openings made of the same material or packages whose components may be separated in a technical and economically viable way), maximising the possibilities for its reuse. It also looks at utilising inputs that are compatible with the recycling process, including labelling recycling together with packaging recycling.

It is important to take packaging life cycle into consideration inside the context in which it will be used. Each case must be studied along with the specificity of the product that will be packed, the place of manufacturing and consumption, the target consumers and the ways of distribution while respecting a package's primordial functions.

By adopting ecodesign principles, the company may benefit from costs and risks reduction, new business opportunities and image improvement.

Packaging information accessibility

Rio 2016™ encourages basic descriptions of products and their specificities in Braille in primary packaging, given the importance of all people's inclusion, including the visually impaired, in the Games.

Legible letters are a decisive factor for the visually impaired to be able to read and understand packaging information.

Instructions for use must be clear, with icons use in order to make reading easier, whenever possible.

Sharp-edged packages that may bear the risk of accidents, such as piercing wounds, must be avoided.

Product development based on universal design premises is recommended, namely equalising use possibilities, flexibility, simple and intuitive use, information collection, tolerance for error, minimum physical effort, space and dimension for use as well as interaction.

Finally, one must think about different possibilities and people's abilities when planning how to take the product out of the package whenever this procedure does not require the use of any tools.

Paper, carton or wood packaging

Each and every package whose primary source is made of forest resources must be certified by the Forest Stewardship Council (FSC), Brazilian National Forest Certification Programme (Inmetro/Cerflor in Portuguese) or the similar *Programme for the Endorsement of Forest Certification* (PEFC).

For further information on competent certifiers, please contact FSC Brasil (Conselho Brasileiro de Manejo Florestal in Portuguese) or Inmetro.

Reverse logistics

National Policy on Solid Waste (PNRS in Portuguese) states that reverse logistics is a socio-economic development tool, characterised by a set of actions, proceedings and means of making solid waste collection and restitution feasible to the business

sector, for reuse - in its cycle or in other production cycles - or for another environmentally appropriate final disposal.

According to PNRS, manufacturers, importers, distributors and merchants of phytosanitary products, waste and packages must structure and implant reverse logistics systems, through the return of products after consumer use, independently of urban cleaning and solid waste handling public services. This also applies to other products whose packages, after use, are considered hazardous waste.

PNRS points out the responsibilities and measures that companies must adopt whenever they manufacture packages and products more easily recycled or that generate less environmental impact.

Whenever requested by Rio 2016™, suppliers, sponsors, and licensees must collect packages for treatment and recycling while bearing all related costs. Initially, Rio 2016™ intends to adopt this prerogative only for packages not complying with the norms established here or that require a non-conventional treatment in order to be recycled.

Packaging materials

The choice of packaging materials must follow the guidelines and requirements established in the Rio 2016™ Sustainable Supply Chain Guide or in the Rio 2016™ Hazardous Materials and Substances Guide.

Rio 2016™ will publish a chart of ideal materials for each type of package and component.

OTHER GOOD PRACTICES

Rio 2016™ also encourages the adoption of the following good practices:

Fast food biodegradable compostable packaging

These packages present excellent rigidity and resistance to water absorption in their inner layer, which combine *offset* procedure and rotogravure printing characteristics. The distinctive visual presentation of recycled paper adds environmental responsibility to the brand, as the first visual contact with the packages will create more empathy with the product. Apart from packages, cutlery and lids may also be biodegradable.

Recyclable packaging made of plastic from renewable sources

Some companies adopt the use of polymeric materials from renewable sources for plastic packages manufacture. This type of polymer is called “green polymer” and may be produced from maize starch and sugarcane, among other options. This is a good sustainable option for packaging companies. One of the main benefits includes the use of raw materials from renewable sources, therefore acting against global warming and the greenhouse effect. The “green polymer” production chain allows a greater reduction of CO₂ levels in the atmosphere when compared to other polymers.

ANNEX 1 - ENVIRONMENTAL LABELLING

The ISO 14020 norm defines three types of environmental labelling:

Type I labelling - Ecolabelling Schemes - NBR ISO 14024

It specifies certifying procedures for label concession, establishing the principles for the development of environmental labelling. It also includes the selection of product categories as well as their functional characteristics and environmental criteria, demonstrating and assessing their conformity.

The adoption of this norm is recommended, as the display of sustainability labels on packages establishes the supplier's commitment and concern with this matter, and it also makes a difference in consumer's perception.

Type II labelling - Self-Declared Environmental Claims - NBR ISO 14021

Self-declared environmental claims consist of the application of symbolologies that comply with the standards set by the *International Organization for Standardization* (ISO), the Brazilian National Standards Association (ABNT in Portuguese) and other symbolologies standardised by the Brazilian market. Its goal is to inform consumers of the type of material used in the package, allowing for an environmentally appropriate disposal.

This norm specifies the requirements for self-declared environmental claims, including texts, symbols and graphics. It also describes selected terms commonly used in environmental declarations and supply qualifications for its use as well as self-declared environmental claims assessment and general verification methodology. Self-declared environmental claims help environmental education as well as the selective collection and sorting of recyclable materials.

The adoption of this norm is mandatory as it is necessary to indicate the best option for package treatment once it is used.

Type III labelling - Life-Cycle Data Declarations - NBR ISO 14025

This norm has a certain degree of complexity due to the inclusion of the "Life-Cycle Data Declarations" tool. It establishes the principles and specifies the procedures for the development of products' life-cycle data declarations programmes.

It may be used as a parameter for the importation of products from countries that are not suitable or ready to meet the Games' requirements.

Its adoption is desirable as the life-cycle analysis of products used in the Games is of great importance.

ANNEX 2: MAIN PACKAGING APPLICABLE LAWS, CONVENTIONS AND NORMS

The main packaging production chain-applicable laws, conventions and norms are presented below.

Federal level laws, normative instructions and resolutions

Law 12,305/2010: institutes the National Policy on Solid Waste, setting its principles, goals and tools as well as guidelines relating to integrated and solid waste management, which includes dangerous waste, as well as generators' and public power responsibilities and applicable economic tools.

Law 9,974/2000: regulates research, experimentation, production, packaging and labelling, transport, storing, commercialisation, commercial advertising, use, importation, exportation, waste and packages final disposal; registration, classification, control, inspection and supervision of phytosanitary products, their components and related materials; and it also sets other measures.

Law 9,832/1999: forbids the industrial use of lead-tin alloy welded metallic packaging for foodstuffs; dried or dehydrated goods excepted.

Law 9,605/1998 (Environmental Crimes Law): establishes actions against those who practice behaviors and activities that are harmful to the environment, which include inappropriate solid waste management.

Anvisa - Normative Instruction n° 9, of 12th November 2002: packaging destined for *in natura* fruit and vegetable containment must meet, without prejudice to the demands stated in other specific legislations.

Anvisa - Resolution RDC n° 20, of 26th March 2008: sets the technical regulations for the post-consumer regrind of food grade polyethylene terephthalate (PET) packaging (food grade PCR-PET) destined to be in contact with foodstuffs.

Anvisa - Resolution RDC n° 17, of 17th March 2008: sets the technical regulations on the positive list of additives for plastic materials destined for the manufacturing of packages and equipment in contact with foodstuffs.

Conama - Resolution n° 334/2003: sets environmental licensing procedures for the establishments destined to receive empty packages of phytosanitary products.

Conama - Resolution n° 275/2001: establishes the colour code for different types of waste, to be adopted in collectors' and transports' identification, as well as in information campaigns for waste sorting.

Norms

ISO 20121 – Event Sustainability Management

ISO 9001 – Quality Management

ISO 14001 – Environmental Management

ISO 26000 – Social Responsibility Management

NBR ISO 14024 – Type I Labelling

NBR ISO 14021 – Type II Labelling

ISO 14025 – Type III Labelling

ABNT ISO/TR 14062 –Environmental Management - Integration of Environmental Aspects into the Project and Development of Products

ABNT NBR 11562 –Dangerous Products Packaging

ABNT NBR 14910 –Foodstuffs Glass Packaging

ABNT/CB-23 – Packaging and Wrapping

International

Rotterdam Convention

Basel Convention

Stockholm Convention

Mercosur/GMC/Resolution 16/93 – Returnable PET packages for non-alcoholic carbonated beverages

European Parliament and Council Directive 94/62/CE of 20th December 1994, on packaging and packaging waste

Environmental Protection – The Packaging (essential requirements) Regulations 2003; n. 1914; UK

Reference Material

A Rotulagem Ambiental Aplicada às Embalagens; Abre e Cempre: 2008

European Parliament and Council Directive 94/62/CE of 20th December 1994

Diretrizes de Sustentabilidade para a Cadeia Produtiva de Embalagens e Bens de Consumo (3rd Edição); Abre

Rio 2016TM Sustainable Supply Chain Guide

Integração de Aspectos Ambientais no Projeto e Desenvolvimento da Embalagem; janeiro de 2006, Abre

Reciclagem de embalagens plásticas usadas contendo óleo lubrificante; São Paulo: FIESP, 2007

04.2013

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