Ecofriendly condoms

Day 2 Session 4.6

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Ecofriendly condoms

Introduction

Condom and pack types

Potential impact on environment

Objectives for ecofriendly condoms

Opportunities and potential focus areas for development

Evaluation

Ecofriendly condoms

Introduction

- **For manufacture of a billion male condoms:**
- **Estimated Quantity of natural rubber involved: about 1,700 Tonnes**
- **Estimated Quantity of chemicals including lubricants: about 550 tonnes plus process chemicals**
- **Estimated Quantity of packaging materials involved: about 4,300 tonnes**
- **Estimated quantity of water used in the manufacturing process: 100,000 kl**

Ecofriendly condoms – condom and pack types

Condoms	Primary packing	Secondary packing	Tertiary packing	Remarks
Female Condom – natural rubber and synthetic materials along with retention features	Pouches of Aluminium laminate, composed of sealant and tie layers	Cardboard outers	Corrugated kraft paper boards, water resistant layer/ coating	Lubricant more than 1g per condom
Male condoms -natural rubber	Aluminium laminate, composed of sealant and tie layers	Wallets, Catch covers, Dispensing outers	do	Lubricant 350 to 750 mg
Male condoms – synthetic rubber	Aluminium laminate, composed of sealant and tie layers	Wallets, Catch covers	do	Lubricant 350 to 500 mg
Synthetic condoms	Aluminium laminate, composed of sealant and tie layers	Wallets, Catch covers	do	Lubricant 350 to 500 mg
Lubricants – Mostly silicone	Exception packs without aluminium in commercial sector	Made of card board	In all cases	

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Potential impact on environment

Raw materials:

Natural latex : Agricultural process impacts such as land deforestation, use of water, pesticides and processing chemicals and preservatives

Synthetic latex and synthetic materials: Chemical process impacts and effluents

Manufacturing operations: Use of water, process chemicals and their effluents, use of HVAC systems

Lubricants used – their availability and disposal

Consumption of high energy in centrifugation and condom manufacturing operations

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Potential impact on environment

Packaging materials:

High energy involved process in manufacture of laminates

Use of plastics in laminate composition

Paper boards consumed in secondary and tertiary packing

Transport and handling requirements:

Use of pallets where required

Carbon emission depending upon the mode of transport

Impact of land fill of solid wastes

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Objectives of Ecofriendly condoms

2030 Agenda for sustainable development

Ecofriendly condoms

Opportunities and potential focus areas for development

Raw materials:

Natural latex: Planned replantation programme, use of high yielding clones, use of biocides as pesticides, efficient handling of water effluent

Synthetic latex and synthetic materials: Move from solvent based to aqueous dispersions, efficient handling of effluents

Manufacturing operations: Solar heating systems where feasible, use of energy efficient heating systems, Heat energy cascades, optimization of production planning for energy involved in storage and handling

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Raw materials:

Lubricants used – Potential reduction of quantity of silicone used as lubricant, alternate lubricants that are appropriate for condom stability and shelf life

Packaging materials:

Primary packing material:

Square vs modified rectangular

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Opportunities and potential focus areas for development

Primary Packaging materials:

1. **Material of construction**:

a) **Exterior layer**:

Avoid PE, move to PET, Glossy Paper, cellophane, METPET, METBOPP, Cutin – Aleuritic acid –cellulose complexes

b) Tie layers:

Recycled/recyclable PE blends, PLA films, PHB films, Polyamides films, Adhesive tie layer between exterior and barrier layers

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c) Barrier layer:

Need for aluminium? – Stability, formulation, shelf life
Thickness – impact of pinholes
Metallised Exterior layer, coated PTFE layers

d) Sealant layer:

Adhesives, heat sensitive and pressure sensitive, low temperature vulcanising polymers

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Opportunities and potential focus areas for development

Secondary packing materials:

Material of construction:

Reduction in weight without compromising strength:

- **Reduction in grammage, fibre reinforced boards**
- **Recycled board blends**
- **Vegetable wax coating for water resistance**
- **Fibre reinforcement**

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Opportunities and potential focus areas for development

Secondary packing materials:

2. Format:

- **Pillow/ pouch packs – cellophane dispensing outer packings**
- **Reusable/Refill containers at dispensing centres**

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Opportunities and potential focus areas for development

Tertiary packing materials:

Material of construction:

- Recycled materials for construction
- Fibre reinforced corrugated cartons – Lignin, cellulose
- Vegetable wax coating for water resistance

Format:

- Integration of pack sizes, number of units, through all the levels of packaging to achieve optimum utilization of pallets sizes and container space

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Opportunities and potential focus areas for development

Tertiary packing materials:

- **Size optimization to reduce processing wastages**
- **Size optimisation for less energy intense material handling**

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Opportunities and potential focus areas for development

Storage, handling, shipment and disposal of condoms:

- Efficient manufacturing systems – reduction in cycle time, inventory holding
- Integrated approach for optimization of weight of the product in all stages of life cycle
- Efficient utilization of spaces and implementation of storage conditions
- Reduction in carbon foot print- consolidation of cargo and route mapping
- Recycling of materials used during disposal of condoms

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Opportunities and potential focus areas for development

Evaluation of measures taken:

EN 13432

ASTM D6400

ICAO Guidelines on transportation

Thank you

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