

Global - External

Thermoform Plastic Packaging

Policy Document

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1. Introduction

Many of Hewlett-Packard's (HP) high volume small products are packaged in a clear thermoform plastic enclosure commonly referred to as clamshell packaging. While mass merchandisers often request this type of packaging, end customers complain to HP about usability and environmental concerns. This document will address both perspectives in addition to HP's policy, and the rationale behind it.

1.1. Purpose and Scope

This document serves to establish Hewlett-Packard's policy on the use of thermoform packaging. The policy will explain what materials are acceptable, their benefits and drawbacks, and why they were selected for use. The policy also provides a set of design features and procedures that are incorporated into the development and qualification of new or modified thermoform packages.

The policies set forth in this document are worldwide, and affect all HP products that use thermoformed plastic packaging.

This document is intended for individuals with the responsibility of developing or specifying thermoform packaging, and to help these individuals respond to customer inquiries.

2. HP Position

2.1. Acceptable Form of Product Packaging

Until consumer buying behavior changes or more successful display methodologies are found, thermoformed plastic enclosures designed and qualified in accordance with this policy will be an acceptable form of product packaging at HP.

The use of PVC material should be avoided in these thermoformed packaging applications when feasible alternative materials exist. All efforts should be extended to seek out alternative solutions and materials that are considered more environmentally acceptable while still meeting the functional requirements. These requirements include but are not limited to:

- Product protection
- Theft-resistance
- Visually pleasing appearance
- Ease of display
- Cost
- Recyclability

HP has several councils to oversee research and development of alternative packaging designs that may better meet the objectives of HP, as well as HP's end-customers and channel partners.

3. Different Perspectives

The views of both the retailer and the customer contribute to HP's current policy, and future goals.

3.1. Channel Partner/Retailer Perspective

The use of thermoformed plastic enclosures for displaying products in the retail environment is increasing. Properly designed thermoformed enclosures can be theft-resistant and display friendly. They can be aesthetically pleasing, display the actual product, and mount quickly and easily on pegged displays.

Many resellers prefer products in thermoformed plastic enclosures due to their anti-theft characteristics. The thermoformed package can not be opened with hands or teeth, so a tool such as a knife or scissors is required. The package is also usually designed to be large so it cannot be concealed easily.

High theft items are often kept behind a reseller's service counter or under glass, even though this is inconvenient to customers. Many resellers will not display products where they are easily accessible to customers themselves unless the products are in thermoformed plastic enclosures. When products are displayed "live" in thermoformed plastic enclosures, customers don't have to wait for a busy clerk to help them and the retailer enjoys reduced labor costs. This customer convenience has been proven to increase sales.

Several resellers will not carry HP products unless they are packaged in thermoformed plastic enclosures. Club warehouse stores require thermoformed plastic enclosures not only for their anti-theft characteristics, but also for their display characteristics and structural strength. Since customer service is limited in these stores, the package itself has to "sell the product". The thermoformed plastic enclosure makes the product easily visible and provides additional space for product information. The club stores also require that the thermoformed plastic enclosure be durable so products can be self-stacked on a pallet or shelf. Club stores see their value proposition as being "wholesale selling to retail". Therefore they require that HP use thermoformed plastic enclosures around the products in their retail packages (especially multi-packs), so the club stores' retail customers can sell the products individually. End-user customers, however, may perceive this as excessive packaging.

Note: Not all HP products sold in thermoformed plastic enclosures are packaged by HP. Some resellers have a third party place HP products in thermoformed plastic enclosures to adapt them to meet their specific retail requirements.

3.2. Customer Perspective

End consumers or customers perceive thermoformed plastic enclosures very differently than retailers. Customers complain that theft-deterrent packaging is difficult to open, and that it may require a tool and a certain amount of force to remove this outer package. Some individuals have an excessively difficult time removing the product from the packaging as they may lack the skill or strength necessary to open the package.

Customers often view this type of packaging as wasteful and excessive. Few curbside-recycling programs will accept thermoform plastic materials, thereby limiting recycling options for customers.

PVC, the most common material used in this type of packaging, is disfavored because it can produce carcinogenic toxin (dioxin) when incinerated for disposal. This subject has received increased attention in Europe.

Customers frequently view thermoform plastic enclosures as over-packaging – *this is the number one packaging related complaint received by the HP Executive Customer Advocacy Group*. When compared to the total number of other customer complaints received by HP, this number is very low.

These drawbacks have not deterred a majority of consumers from purchasing products.

3.3. Government Perspective

The European Union does not look favorably on thermoform plastic enclosure packaging; it also is tentatively considering a ban of PVC in some applications. They also view thermoform packaging structures as difficult in waste recovery and creating excess void space in recovery bins. However, at this time there are no laws that limit the use of PVC material or the use of thermoform packaging.

3.4. Packaging/Material Industry Perspective

Generally, the industry views thermoform packaging structures as a viable option for displaying product in retail locations. The PVC

industry has been very active in defending the benefits of PVC materials and countering perceived rumors and untruths. They also believe that disposal of the material is safe when handled properly in appropriate facilities.

3.5. HP's Perspective

HP believes the use of thermoformed plastic enclosures can be an effective method of source reduction in some cases. It is clear that the utility properties of this type of packaging have been successfully received by reseller channels. However, the use of PVC should be avoided in these packaging applications when feasible alternative materials exist. All efforts should be extended to seek out more environmentally acceptable solutions while still meeting functional and cost requirements.

There will be ongoing efforts by HP and resellers to accommodate display and antitheft requirements and the consumer's ease of opening and recycling activities. HP will continue to pursue improvements to its packaging shapes, sizes and materials that will satisfy reseller and customer requirements.

4. Policy

HP's policy regarding the selection of thermoform materials is not static. The policy is designed to accommodate fluctuation of material availability, costs, usability, and environmental considerations.

4.1. Material and Design Considerations

4.1.1. Preferred Materials

In order of priority, these are:

1. Commodity Resin – *best choice*
 - PE
 - PET
 - PP
2. Non-commodity Resin – *next best*
 - PS

Materials to Avoid

The following materials should be *avoided* for use in HP packaging:

- Halogenated Resin (PVC)

4.1.2. Environmental Considerations

The environmental impact of materials not on this list should be reviewed with HP Packaging Environmental Advisory Council (PEAC).

¹ ISO 1043 (the code for resin recycling) and the SPI resin-recycling symbol and numbering must be embossed on the thermoform material.

The identification symbol for packaging material shall appear as shown in Figure 1. Recycling Symbol, below:

¹ ISO – the International Organization for Standardization.

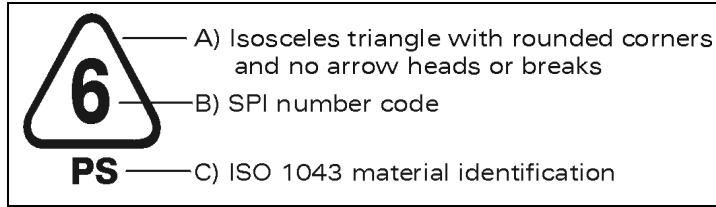


Figure 1. Recycling Symbol

A) is the figure outline; an isosceles triangle with rounded edges. This figure is similar to the SPI marking except the arrows have been removed. This was done to avoid misinterpretations found with the "chasing arrows" symbol and to eliminate confusion regarding recycle/recycled identification.

B) is the numerical identification for the material and has been taken from the SPI standard, due to consumer familiarity with the SPI system and the simplicity of this indicator. The use of number "7" is not recommended because this identification is vague and is no longer needed due to the specificity of the ISO 1043.

C) is the acronym identifying the material. These acronyms follow ISO 1043 for plastic materials. In cases where hybrid resin materials are used but are not covered or identified by ISO 1043, the base monomer or standard industry acronyms should be used, for example RPET, PETG, and HIPS.

Table 1. Materials Identification

Material	ISO 1043 Acronym	SPI Number
Polyethylene Terephthalate	PET	1
Polyethylene - High Density (HDPE)	PE-HD	2
Polyvinyl Chloride (vinyl)	PVC	3
Polyethylene - Low Density (LDPE)	PE-LD	4
Polypropylene	PP	5
Polystyrene	PS	6
Polycarbonate	PC	
Acrylonitrile/butadiene/styrene	ABS	

4.1.3. Packaging Constraints

The mass (weight) of thermoform material should be minimized taking into account the specific marketing application and performance requirements. This includes using alternate material to achieve the overall objective. For example using the minimum amount of thermoformed material to enclose the product and embedding it in an

outside paperboard wrap which meets the size (footprint) and messaging requirements.

When practical the enclosure should display “bare” product, rather than a product that is already enclosed in retail packaging. See Figure 3. Bare Product Packaging on page 13.

4.1.4. Material Costs

Raw material expense must not be the only factor considered when selecting a material for thermoform application. The total overall cost needs to be addressed, as processing-time, tooling, material performance, and assurance of supply can add a significant amount to the final delivered solution. However, with that in mind. the following are some *general* assumptions about alternative materials to PVC:

- REPT is about 5% less expensive
- PETG is about 40% more expensive
- Co-extrusion materials are much more expensive

4.1.5. Easy-Open Packaging Goals

Investigate design elements that are intuitive and facilitate easy and safe methods for the customer to open the package with a proper tool, scissors for example. This design should not compromise the theft resistant aspects of the package.

Shear strength or "cut-ability" of the package should be set to a minimal level so the targeted customers/users of the product can confidently cut open the package. Reduction of shear strength can be achieved by reducing material thickness. Real-life usability tests, whereby targeted customers/users of the product are observed opening (or trying to open) proposed packages, are strongly recommended for the development and qualification of thermoform package solutions.

4.2. Background

Thermoformed plastic enclosures can partially or completely envelop a product or other package. There are two major design types:

- Overwrap packaging (layer of encapsulation over the original product packaging)
- Bare product packaging - preferred

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Figure 2. Overwrap Packaging



Figure 3. Bare Product Packaging