POLY VINYL CHLORIDE (PVC), POLY VINYLIDENE CHLORIDE (PVdC) and POLYPROPYLENE CHLORIDE (PPC)

POLICY

Unilever will progressively eliminate the use ofPVC in packaging and promotions. This will be done in the following ways:

1) There will be no new applications of PVC /PVdC in Unilever new product formats where development is initiated after 1st September. 2008
2) Where technically viable alternatives exist, PVC/ PVdC will be replaced by the end of 2009
3) Where there are no technically viable alternatives to PVC or PVdC (e.g. seals on metal lids for glass jars) a research programme to eliminate these compounds will be put in place with the goal of eliminating them by end 2011

EXTERNAL STATEMENT

Poly vinyl chloride (PVC) has historically been an important material for packaging applications, being both technically versatile and aesthetically attractive (it can be made "glass clear") Historically PVC was used as a bottle material but more recently the dominant usage of PVC in Unilever has become cap linings (particularly for glass jars, shrink sleeves, and toothbrush blisters). It is also used in promotional activities, both for building promotional displays, and in some cases as the material of a promotional give away (e.g. beach shoes, wash bags)

Poly Vinylidene Chloride (PVdC) is not typically used as a packaging material in it's own right, but is used as a coating/laminate layer which is both heat sealable, and has good barrier properties. It is often therefore used as the inner laminate of pouches tubes and sachets for oxygen sensitive contents.

PPC is little used in Unilever, but has been used in a hot printing process for toothbrush handles

PVC, PVdC, and PPC are carbon based plastic polymers that contain Chlorine atoms in their polymer structure. Hazards can arise from the uncontrolled burning of chlorine containing plastic polymers, which can lead to the formation of dioxins, and furans which are highly toxic. Indeed the United Nations Environment Programme document UNEP/POPS/EGB.2/INF.6 "Information and Comments Received on Open Burning" of 23rd October 2003 contains these statements :
"PCDD (= dioxins*)/PCDF (=* furans*) can form due to incomplete combustion of carbon in the presence of chlorine. Open or uncontrolled burns represent poor fuel/oxidant mixtures leading to uncombusted carbon. If chlorine is present, reactions with the carbon structures may lead to PCDD/PCDF formation. The practice of open combustion must ensure that the conditions for generating PCDD/F are minimized and eliminated*". The document goes on to recommend *"Avoid mixed fuels with contaminants of chlorine, or products made with chlorine".*

PVC can also be associated with phthalate plasticisers- although these are rarely used in packaging applications. Unilever has a separate policy to reduce and ultimately eliminate all phthalates from its

products.

Although the proportion of the total amount of these materials represented by Unilever applications is very small, there remains the possibility that Unilever packaging could be burnt in this way. Even where burned in incinerators built to modern international emission standards, the problem of disposing of any dioxins formed that are subsequently absorbed by the incinerators emission control systems remain.

As with all packaging materials, Unilever monitors new scientific evidence and takes account of public opinion and the availability of suitable alternatives with comparable aesthetic, technical and cost properties. In view of the changing climate of public and customer opinion, and concerns about uncontrolled incineration Unilever has decided that PVC packaging should be eliminated.

INTERNAL INFORMATION

Promotional and POS Items

PVC has a range of functional properties that make it difficult to replace in a number of applications. In particular when an item is designed either to inflate or to erect on a frame:
However such items may still be potentially disposed of by incineration, so therefore PVC for promotional items must be avoided. Items given away as promotional gifts that are made of PVC (for example plastic beach shoes) should also be avoided

Stationery Items
PVC is commonly used for folders, binders and presentational materials. Although these are designed such that they can be used for a sustained period, and, despite the fact that as they are used in Unilever offices their disposal is likely to be controlled, their use must be avoided as there is still a potential issue with dioxin residue in incinerator scrubbing systems.

Environmental Impact During Unilever Use
The environmental issue with PVC occurs at the point of disposal (although, according to Greenpeace, dioxins can also be formed during manufacture). According to the standard measures adopted by Unilever, the use by consumers of PVC packaging does not have any abnormal or excessive impact on the environment.

Recycling
While used PVC packaging is recyclable and, where collected can be efficiently recycled, it is now very much a minority plastic, and most recyclers focus on the plastics in higher proportion in the waste stream, and it is now seem as a potential contaminant in the recycling stream in many parts of the world. PVdC tends to be used in flexible laminate structures giving both heat sealing and barrier properties, so it is generally found in mixed plastic applications. These would tend not be recycled, but may be commercially incinerated with energy recovery, disposed of by open burning, land filled, or remain as environmental litter

Phthalates & PVC
PVC also receives bad press because phthalate plasticisers have typically been used in its manufacture. Some phthalates are oestrogen mimics, and there is public concern about their use. For typical packaging applications such phthalates are not used.

Commercial implications
It is likely that there will be an on cost from moving away from PVC in some regions of the world, but elimination of PVC is a conscious decision taken with in knowledge of this. Unilever's public reputation as a sustainable company is at stake if PVC is not eliminated. It is for this reason that this policy has been approved by U-Ex.

For PVdC, while it is not "high tonnage" - being used at additive levels, typically as a thin layer in a flexible laminate structure, it's use is relatively wide spread- particularly for food applications, as it's dual properties of heat seal-ability and barrier properties make it an efficient material to do two jobs at once. Eliminating it is likely to have significant on cost and resource implications

PVC as a structural building material

This policy does cover PVC in building materials (such as pipes, and window frames). These are durable uses for PVC, where it is used for many years so not requiring regular disposal like PVC in packaging. This fact, together with the fact that increasingly recycling schemes for used building materials are being put in place means that PVC in buildings is much less likely to be incinerated. PVC as a building material is supported as it is positively beneficial to the environment- it makes strong and durable pipes to supply and drain water, and PVC double glazing saves many millions of tonnes of CO_2 emissions annually through improved insulation.

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UEx APPROVED DATE: