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To: ECY RE HWTR SaferProductsWA
Subject: Comments regarding OFRs in Electronics
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Comments on Washington Safer Products Regulation

Comments by Tim Cassidy, retired electrical and electronics product safety expert.

Consequences of Replacing Existing Plastics with Alternative Flame Retardants

Cost, Availability, and other Market Factors

The work on this regulation so far has determined that there are *alternatives* to existing FR chemicals and that these alternatives are safer. It is therefore assumed it is *feasible* to replace them. The analysis appears to neglect the consequences of the alternatives for their ready use. Analysis seems to suggest that if these chemicals are available, they are so in sufficient supply, as additives to plastics to simply replace existing plastics as direct substitutes. So far, no evidence has been presented to support these conclusions. The plastics supply chain is long and complex. If alternative, existing chemicals are eliminated for use, it will result in a shift of demand and the costs will be higher. Further, additives result in alteration to the properties of plastics all of which impact the design and performance of products using them. The shift in demand may also impact availability by the sudden increase in use. It does not seem that these market forces have been in any way evaluated indicating that alternatives may or may not be feasible.

Requalification of Existing Products

Flame retardants are used explicitly to prevent the acute toxicity of fire. The plastics containing the FRs have many other performance attributes impacted by additives in plastics. Plastics used in electrical and electronic products perform several other functions. For example, barrier to electrical shock, impact resistance, aesthetic properties, thermal communication with the environment and many others. If an alteration of additive is made to a plastic, it is no longer the same plastic, and not necessarily a viable substitute. As a result, the substitution of one plastic with another requires significant product requalification that goes well beyond product safety. Qualification of products is expensive and time consuming. It can cost in the range of multiple-tens of thousands of dollars per item and take between six and twelve months to accomplish, with no guarantee the new item will “pass” without significant and expensive alteration.

Besides the end item, the plastic is molded into the desired form and thickness. This means the mold itself must accommodate the alternative. Additives may impact the molding tools operation and life span. Molds are very expensive requiring sophisticated machining to produce. Molds have

"gates" that allow plastics to flow into the mold. This is done at specific temperatures and pressures with the design of the tool set for a known functional spread of the injected plastic. Alterations to the exact make-up of the plastic may have an impact on the moldability. Therefore, molds must be requalified as well as final products.

Availability and Feasibility are Two Different Concepts

The analysis so far performed by DOE (as openly stated by staff) has conflated *availability* with *feasibility*. Because something is available does not indicate that is it feasible. Skim milk is available but is in no way a feasible substitute for heavy whipping cream. Both products have much in common, and a world of difference. Likewise with FR chemicals.

Feasibility must account for market dynamics such as the impact on availability of eliminating substitutes, the cost impacts and the resultant impact of end product availability and purchasability by consumers. Feasibility must consider the product development timelines and expense.