

DecaBDE and BFR Substitution in the Electronics Industry: Leading Manufacturers are Moving Away from Bromine Chemistry in Computers and Televisions

The combined impact of increased market demand for products free of brominated flame retardants (BFRs), especially decabromodiphenyl ether (decaBDE), and emerging regulations on persistent, bioaccumulative, and toxic (PBT) chemicals has caused leading electronic companies to completely eliminate decaBDE and all other BFRs from their product lines. To reduce exposure and risk to chemicals that are potentially toxic across their life cycle, many companies are working to flame retard their products with new design strategies that maintain fire safety while decreasing the toxicity of the product.

The major end use for decaBDE is in electronic products, in particular televisions (TVs). In the U.S., television manufacturers constitute 45–80% of all decaBDE use¹. Manufacturers of other electronic equipment, including manufacturers of personal computers (PCs) have largely eliminated their use of decaBDE. In its assessment of decaBDE use and substitution, Washington State estimates that **“about 57% of TVs and 95% of computer products are PBDE-free,”** meaning free of decaBDE².

The PC manufacturers have taken the lead in eliminating their use of decaBDE as well as other brominated flame retardants. Five of the top six manufacturers of PCs in the U.S. have eliminated decaBDE use in PCs:

- **Dell (#1 in U.S. PC sales) has eliminated its use of decaBDE and plans to eliminate all BFRs by 2009.**

Profile of Bromine Fire Resistant Free Television Available Today

In 2003, the Sharp AQUOS held 50.9% of the world LCD TV market. The TV casing is made from PC/ABS resin using a phosphorus-based flame retardant. **The cabinet meets the UL V-0 fire resistance standard.** A 30-inch unit compared with a CRT TV of equivalent size (32-inch), consumes 38% less power, is one-sixth the depth, and weighs only one-third the CRT TV.

Source: Lowell Center for Sustainable Production (LCSP), *Decabromodiphenylether: An Investigation of Non-Halogen Substitutes in Electronic Enclosure and Textile Applications*, Lowell: LCSP, 2005.



- **HP (#2 in U.S. PC sales) has had a policy in place banning decaBDE for over a decade.** Recent research by Greenpeace found decaBDE in an HP laptop³, highlighting the importance of comprehensive supply chain management.
- **Toshiba (#4 in U.S. PC sales) does not use decaBDE in computer products.**
- **Lenovo (#6 in U.S. PC sales) has eliminated PBDEs in all of their products.**
- **Apple (#5 in U.S. PC sales) has eliminated PBDEs in some products** and in plastic parts weighing more than 25 grams.

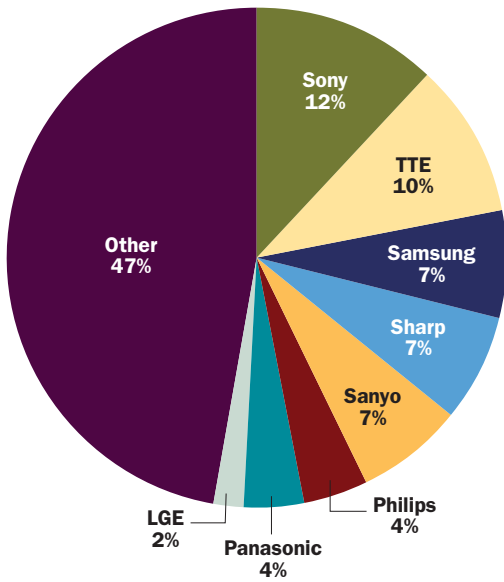
While, as the Washington State research indicates, it is likely that Gateway (#3 in U.S. PC sales) has also eliminated decaBDE, our research revealed no data on the use or elimination of decaBDE by the company. See Table 1 (page 2) for details on the progress made by PC

manufacturers in eliminating decaBDE and other BFRs as well as references for the data cited above.

In the largest market for decaBDE in the U.S., TVs, some manufacturers have eliminated the use of decaBDE and other BFRs. By 2010, if manufacturers follow through on their plans, four of the eight largest TV manufacturers selling in the U.S. will have eliminated decaBDE use:

- **Sony (#1 in U.S. TV sales at 12% market share) has already eliminated decaBDE.**
- **Panasonic and Philips (tied for #6 in U.S. sales with 4% market share) have also eliminated the use of decaBDE in their products.**
- **Samsung (tied for #3 in U.S. sales with 7% market share) plans to eliminate decaBDE from all products by 2006 and all other BFRs by 2010.**

FIGURE 1 TV Sales in the U.S. by Manufacturer (2005)



- **LG Electronics (#8 in U.S. sales with 2% market share) plans to eliminate decaBDE and all other BFRs by 2010.** LGE includes the Zenith brand.

Together these manufacturers account for 29% of all TV sales in the United States. Sharp, with 7% market share, has eliminated decaBDE in some of its TV models. TTE (10% market share), which includes the RCA brand, and Sanyo (7% market share) have made no public commitments or statements on their use of or plans to eliminate decaBDE in TVs. As illustrated in Figure 1, a large segment of TV sales in the U.S. are filled by smaller players, the “others,” that account for 47% of the market. Some of these companies, like Dell, HP, JVC and NEC, have eliminated their use of decaBDE. See Table 1 for details on the progress made by these TV manufacturers in eliminating decaBDE and other BFRs as well as references for the data cited above.

The fact that leading manufacturers of TVs and PCs have eliminated or plan to eliminate decaBDE by 2010, proves that substitution of decaBDE with other flame retardants that meet the same safety standards is possible.

Table 1. Assessment of DecaBDE Substitution in PCs & TVs (November 2006)						
Manufacturers	Market Leadership	No Deca Substitution or No Data	Partial Deca Substitution: some products	Goal of Deca Substitution by 2010 or earlier	Complete Deca Substitution Achieved	Goal of BFR Substitution
Top Personal Computer (PC) Manufacturers Selling in the U.S.⁴						
Dell	#1 U.S. Sales				for all products ⁵	by 2009
HP	#2 U.S. Sales				for all products ⁶	
Gateway	#3 U.S. Sales	no data ⁷				
Toshiba	#4 U.S. Sales				for PCs ⁸	
Apple	#5 U.S. Sales		for product parts >25 g ⁹			
Lenovo	#6 U.S. Sales				for all products ¹⁰	
Top Television (TV) Manufacturers Selling in the U.S.¹¹						
Sony	#1 U.S. Sales				for all products ¹²	
TTE (includes RCA)	#2 U.S. Sales	no data ¹³				
Samsung	#3 U.S. Sales				by 2006 ¹⁴	by 2010 ¹⁵
Sharp	#3 U.S. Sales		for some products ¹⁶			
Sanyo	#3 U.S. Sales	continued use of deca ¹⁷				
Philips	#6 U.S. Sales				for all products ¹⁸	
Panasonic / Matsushita	#6 U.S. Sales				for TVs ¹⁹	
LG Electronics (includes Zenith)	#8 U.S. Sales			by 2010 ²⁰		by 2010
Other TV Manufacturers Selling in the U.S.						
Dell ²¹ , HP ²² , JVC ²³ , NEC ²⁴	Unknown Sales					

Red: No data found through internet searches and no response from the company to outreach by the Computer Take Back Campaign on whether the company has eliminated the use of decaBDE.

Orange: Company offers one or more deca free products.

Yellow: Company has a timeline to remove all decaBDE from its products

Green: Company has successfully removed all decaBDE from its products.

References

- 1 Washington State Department of Ecology and Department of Health. 2006. Washington State Polybrominated Diphenyl Ether (PBDE) Chemical Action Plan; Final Plan, <http://www.ecy.wa.gov/pubs/0507048.pdf>, p. 1.
- 2 Ibid, p. 65.
- 3 Source: <http://www.greenpeace.org/raw/content/international/press/reports/greener-electronics-hp-ranking.pdf> (accessed 11/14/06).
- 4 Source for market share data: IDC Worldwide Quarterly PC Tracker, April 19, 2006.
- 5 Source: http://www.dell.com/content/topics/global.aspx/corp/environment/en/dell_bfr?c=us&l=en&s=corp (accessed 11/14/06).
- 6 Source: <http://www.hp.com/hpinfo/newsroom/press/2005/051101a.html> (accessed 11/14/06).
- 7 Searches of 1) Gateway's website, including its environmental policy webpage as well as using Gateway's search function for "decaBDE", "PBDE" and "BFR" and 2) Google™ for "Gateway computers decaBDE", "Gateway computers PBDE" and "Gateway computers BFR" revealed no data on Gateway's use or elimination of PBDEs or BFRs (accessed 11/15/06).
- 8 Peter Leone, Manager, Product Safety & Standards Compliance, Toshiba America Information Systems, Inc., letter to Alexandra McPherson, Clean Production Action, March 30, 2006.
- 9 "Apple does not allow the use of antimony trioxide or any brominated flame retardant in plastic parts weighing more than 25 grams. Many Apple products have enclosures made of inherently flame retardant aluminum and polycarbonate plastic, reducing the need for added flame retardants" (<http://www.apple.com/environment/materials/> (accessed 11/14/06).
- 10 Pierce, Mike (Lenovo Corporation, Global Environmental Affairs). 2006. Lenovo Engineering Specification 41A7731: Baseline Environmental Requirements for Materials, Parts, and Products for Lenovo Hardware Products. http://www.pc.ibm.com/ww/lenovo/procurement/Guidelines/41A7731_783906N,R0,WORD,SRC.doc (accessed 11/15/06).
- 11 Ross Young, 2005, "Total TV shipments rise 13% Y/Y in Q1'05: TTE #1 in TV shipments, Sony #1 in revenues," http://www.displaysearch.com/free/articles/vol10_issue6_totaltv.pdf (accessed 11/15/06).
- 12 Source: http://www.sony.net/SonyInfo/procurementinfo/ss00259/qfhh7c000000bb6-att/ss259_excerpts_j.pdf (accessed 11/14/06).
- 13 Searches of Google™ for "TTE decaBDE", "TTE TV decaBDE" "TTE PBDE", "TTE TV PBDE", "TTE BFR", "TTE TV BFR" as well as similar searches replacing "TTE" with "RCA" uncovered no data on decaBDE or BFR substitution at TTE (accessed 11/15/06).
- 14 Michael Moss, Environmental Senior Manager, QA Lab, Samsung Electronics America, personal communication to Alexandra McPherson, Clean Production Action, November 17, 2006.
- 15 Source: <http://www.greenpeace.org/raw/content/international/press/reports/greener-electronics-samsung-ra.pdf> (accessed 11/13/06).
- 16 Sharp set a goal of eliminating the use of all PBDEs (which includes decaBDE) in electronics by 2004 or 2005 at the latest (see <http://sharp-world.com/corporate/eco/customer/pdf/manual4.0e.pdf> - accessed 11/15/06). Yet, the company's webpages do not state that Sharp has eliminated its use of decaBDE. Since the goal date has passed without evidence of Sharp meeting its goal and data exists that Sharp has eliminated decaBDE from some products, including in its AQUOS LCD TV models -- see the Lowell Center for Sustainable Production, 2005, Decabromodiphenylether: An Investigation of Non-Halogen Substitutes in Electronic Enclosure and Textile Applications and <http://www.digitaltdesignline.com/showArticle.jhtml?printableArticle=true&articleId=164300133> (accessed 11/15/06) — the company is listed under "Partial Deca Substitution".
- 17 A search of Sanyo's environment website — <http://www.sanyo-component.com/mc/environment/rohs-compatibility.html> (accessed 11/15/06) — indicates that the company is continuing its use of decaBDE: "RoHS has not yet been implemented in all Member States due to an ongoing discussion in the Technical Adaptation Committee (TAC) at the European Commission. Therefore SANYO is evaluating each single part for its RoHS compatibility based on the preliminary limit values known so far."
- 18 Source: http://www.philips.com/assets/Downloadablefile//SAR_2004-15667.pdf (accessed 11/14/06).
- 19 Panasonic 2006 survey response to the Computer Take Back Campaign (sent 10/06).
- 20 Source: <http://www.greenpeace.org/raw/content/international/press/reports/greener-electronics-lg-electro.pdf> (accessed 11/14/06).
- 21 Source: http://www.dell.com/content/topics/global.aspx/corp/environment/en/dell_bfr?c=us&l=en&s=corp (accessed 11/14/06).
- 22 Source: <http://www.hp.com/hpinfo/newsroom/press/2005/051101a.html> (accessed 11/14/06).
- 23 JVC has implemented the RoHS directive on a company wide basis, including PBDE elimination - see <http://www.jvc-victor.co.jp/english/company/envirom/wr/pdf/ear2006e.pdf>, p. 19 (accessed 11/15/06).
- 24 NEC banned the procurement of products containing PBDE in 1997 — <http://www.nec.co.jp/eco/en/annual2005/04/4-3-06.html> (accessed 11/15/06).