Newsletter
National Service of Assistance
BPA SUBSTITUTION
N°4 January 2014

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BPA NEWS

BPA SUBSTITUTION NEWS

Ecozen, an alternative to polycarbonate.

Ecozen® is a partially bio-source polymer developed by SK Chemicals (South Korean company) to replace polycarbonate in the manufacture of food containers and small cosmetic bottle products. The grades of the Ecozen® YF [(1)] range have been approved for food contact, particularly by the FDA (Food Contact Substance (FCS) Number: 1075). According to SK Chemicals, this material also complies with EFSA (European Food and Safety Authority) requirements, as well as section 7 of the Korean Food Standard Codex of the KFDA (Korean Food and Drug Administration).

This co-polyester is composed of several monomers: the PTA (Purified Terephtalic Acid), the CHDM (Cyclohexanedimethanol), ethylene glycol and isosorbide (corn extract). The percentage of each monomer varies according to grades, affecting the Glass Transition Temperature (Tg). Compared to polycarbonate, Ecozen® displays according to its manufacturer, good transparency, shine and resistance to high temperatures, but also significantly improved chemical inertness, better barrier properties and increased mechanical strength (Environmental Stress Cracking Resistance). On the other hand, its impact resistance is inferior to that of polycarbonate, and its price is approximately double (approximately 4 €/kg).

Currently marketed in Europe, the production capacity of Ecozen® is 100 kt/yr divided between several sites in Southeast Asia. Sk Chemicals European subsidiary is located in Germany.

[(1)] Ecozen® YF 100, Ecozen® YF 200, Ecozen® YF 300 and Ecozen® YF 400

Source:
http://www.skchemicals.com/korean/product/ecozen/sub/sub_overview.asp?menum=11

Hempadur BPA Free 37301, is an epoxy coating for the food-processing industry which is based on Bisphenol F instead of BPA.

This BPA-free epoxy resin was developed by Hempel in the USA for the coating of interiors of containers, tanks used in production and storage of food processing products, silos and freight cars intended for containing food products (sugar, dry or liquid foods) or plastic granules that are approved for food contact. This Novolac glycidyl ether (NOGE) resin is produced on a Bisphenol F base without the use of solvents. Bisphenol F is a molecule structurally close to Bisphenol A, and what is more, suspected of being reprotoxic (see ANSES report). Because of this, it seems difficult to consider Hempadur BPA Free 37301 as a sustainable alternative to BPA-based resins. Besides, other tests are necessary to insure that it would be compatible with canned good coatings. White in color, it displays a glossy finish. It can only be used in applications where the maximum temperature is 120°C (248°F) (exposure to dry product only). Commercially available in the USA, it conforms to FDA requirements (21 CFR 175.300, "Resinous and Polymeric Coatings"). Its price is higher than BPA-based epoxy resins.

Sources:
http://www.paintsquare.com/news/?fuseaction=view&id=6586
http://www.anses.fr/fr/documents/CHIM2009sa0331Ra-1.pdf

MatOx technologies is researching new solutions for BPA replacement.

Based in Oxford (Great Britain), MatOx Technologies is an innovation development company, particularly in the field of BPA replacement. Several replacement solutions are currently under development, some have patents filed and others are in the process (two of these new technologies are based on molecules close to BPA):

- A technology based on the derivatives of cyclohexanediol, made for the production of food container coatings.

- A technology based on recyclable and durable resins, produced from natural oils, fatty acids and gelatin. They are under development for food packaging, specifically the interior coating of containers.

- A technology based on the use of a BPA derivative obtained by alkylation of this molecule (via Friedel-Crafts Alkylation), which allows molecular structure modification. The BPA derivative obtained is compatible with polycarbonate and epoxy resin synthesis.

- A technology based on hydrogenated BPA polymers. A cycloaliphatic type structure is obtained from the polymer, which conserves the majority of the physical properties sought in BPA. Additionally, these polymers display better flexibility.

MatOx is looking for industrial partners to develop these technologies into applications, including those involving food contact (for more information, contact sean.smith@matoxtechnologies.com).
Source: http://www.matoxtechnologies.com/

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INTERNATIONAL / DRINKING WATER

In 2002, a campaign of analyses was performed in Sweden which focused on drinking water. It showed the presence of BPA due to the sheathing of pipes containing epoxy resins, especially hot water pipes. The Swedish agency in charge of chemical products (Swedish Chemicals Agency or KEMI) proceeded to perform a risk assessment(1). It concluded that the concentration levels found in drinking water posed no threat to human health. However the toxicological reference values used were those of the EFSA as of 2012, which are less strict than those recently published by the EFSA in 2014 (2), and the ones used by ANSES during its risk assessment (see tab Documentation du site (Site Documents)

Sources: http://www.chemsec.org/news/news-2013/january-march/1144-bpa-found-in-tap-water

(1) http://www.kemi.se/en/Content/News/Low-levels-of-bisphenol-A-in-analysed-water/

(2) http://www.efsa.europa.eu/fr/consultations/call/130725.pdf

Agenda

EUROPEAN SUMMIT ON PACKAGING.
January 2014. Germany. http://www.eupacksummit.com

FIFTH ANNUAL SUMMIT ON BIOSOURCED NEW GENERATION CHEMICAL PRODUCTS INFOCAST.
February 2014. USA.
http://chemicalwatch.com/16904/infocasts-5th-annual-next-generation-bio-based-chemicals-summit

INTERTEK FOOD CONTACT COMPLIANCE SEMINARY
February 2014. Netherlands.
http://chemicalwatch.com/17348/ready-for-food-contact-compliance-seminar

Publications

In March 2013, Subsport published a report on BPA replacement, proposing a list of possible alternatives in three application areas under regulatory scrutiny: polycarbonate food containers, canned goods and drink cans, and thermal papers.

Polycarbonate represents 80% of BPA use in Europe (figures 2005/2006). The report's focus was primarily an in-detail comparison of three alternatives to this material: polypropylene, polyethylene and PET. The other alternatives listed were not taken into account in this analysis due to insufficient information on their true components, their CAS number and their toxicity. PES (polyethersulfone) was excluded from the evaluation due to the presence of BPS which gives it toxicity comparable to BPA. The proposed evaluation leads to the conclusion that all three alternatives are similar to polycarbonate in terms of performance and cost, and have low toxicity and ecotoxicity. Therefore they constitute economically and technically viable solutions to polycarbonate replacement in food containers.

Source: http://www.subsport.eu/wp-content/uploads/data/bisphenol_A.pdf