From HBCD to the alternative flame retardant

- KANEKA Japan’s example -

KANEKA corporation. Tokyo Japan

KANEKA's EPS/XPS Overview

KANEKA

- KANEKA : Dealing not only foam but also plastics, modifier, solar cell etc.
- Trade name of EPS : KANEPEARL® / XPS : KANELITE®
- History : both foam products have over 40 years result.
- Factories (EPS & XPS) : only in Japan.
- HBCD : already switched to alternative flame retardant
- For building&comstruction market : both EPS (certain grade only)& XPS

Reference: Situation of HBCD (Japan)

- EPS : Already switched HBCD to alternative flame retardant
- XPS : Not yet. Switch HBCD to alternative flame retardant by April 2014

KANEKA's

Steps for selecting the alternative flame retardant

1. Search : Chemicals for the alternative FR
2. Evaluate : Evaluate chemicals proposed
3. Sales : Take developed foam to the market

Note:

KANEKA has not developed the FR itself.

KANEKA started the steps already a few years ago because of legal concern.

1. Search : Chemicals for the alternative FR

Try to choose the chemicals suitable for the alternative flame retardant

1st Picking up from :

Literature, manufacturer's information etc.

2nd Screening :

Rough screening for selected chemicals.

Key factors for the alternatives

- EHS (environment, occupational health and safety): Better than HBCD
- Cost : Need to balance with unit price and dose
- (Final) Foam products property : Comparable with current

2. Evaluate : Evaluate chemicals proposed

Evaluate selected chemicals suitable for the alternative FR or not

Evaluating points :

1. For manufacturing foam (test in lab 1st . Finally in industrial scale)
   - Performance in EPS polymerization
   - Performance in XPS compounding and extrusion

2. Foam products property (example of major property only)
   - ・Thermal conductivity, Mechanical strength
   - ・Flame retardancy

Factors for selection:

a) Polymeric type FR
   - Availability (volume and price) in a few years
   - EHS considerations

b) Non-polymeric type FR
   - Already available enough volume in Japan

Problems

Polymeric FR	Non-polymeric FR
Poor thermal stability (compared with HBCD)	Poor thermal stability (compared with HBCD)
Poor light-proofness (compared with HBCD)	

KANEKA developed manufacturing technology with the alternative FR having poor thermal stability problem.

The problem about poor light-proofness still remain.

3. Sales : Take developed foam to the market

Developed foam products with the alternative FR to the market.

To the market : finished

EPS : 2012 XPS : Summer 2013

Switching has been “seamless” without major issues

Now:

Distinguish the alternative FR grade from HBCD grade

Still under discussing (name, markings, colors)

Should be considered

Current brand image

Quality assurance program (certification)

Optimize the manufacturing processes & foam property

Thermal stability (poor heat resistance)

Light-proofness (considering to use UV absorber)

Conclusion

Recap

Start developing already for a few years ago

Because of Japanese legal concerning

In Japan, for the alternative flame retardant (FR),

Polymeric type FR and non-polymeric type FR both available

Both FR : OK for EPS & XPS

Remaining problem,

Unit price (acceptable but both higher than HBCD)

Light –proofness (poor than with HBCD)