The European Stabiliser Producers Association

The Future of tin stabilisers in PVC applications

PVC Formulation conference
Cologne, 16-18 March 2010

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European Stabiliser Producers Association

- Pan-European trade association representing more than 95% of the stabiliser industry across Europe
- Affiliated to Cefic - the European Chemical Industry Council
- Member of Vinyl 2010 (www.vinyl2010.org)
- A unique organisation representing four sub-groups:
  - ELSA (97%) – Lead stabilisers major use in pipe and profiles
  - ECOSA (90%) – Calcium organic stabilisers for food contact & medical applications, plus all lead replacement systems
  - ETINSA (100%) – Tin stabilisers used primarily in rigid applications including food contact use
  - ELISA (95%) – Liquid stabilisers used in a wide range of flexible PVC, calendered sheets, flooring
ESPA mission statement

- Promote the use of PVC stabilisers
- Provide information to users, legislators and other interested parties on safety, health and environmental issues related to PVC stabilisers
- Work with industry partners, associations and other stakeholders to support the safety and sustainability of stabilisers and PVC
- Carry out research relevant to safety and sustainability
- To be an active partner in Vinyl 2010 (www.vinyl2010.org)
Members

ESPA - sub group ETINSA

- Akcros
- Akdeniz Kimya
- Asua
- Arkema
- Baerlocher
- Chemson
- Dow
- Chemtura
- Floridienne Chimie
- Lagor
- Reagens
Tin Stabilisers

Market trends & applications
2009 consumption by stabiliser type
Western + Eastern Europe

- **Ca-based**: 41%
- **Lead**: 44%
- **Tin**: 7%
- **Liquid MM**: 8%

**Total 184,400 tons**

**Stabiliser** | **Tons**
--- | ---
Lead | 82,000
Ca-based | 76,000
Liquid MM | 14,000
Tin | 12,400
**TOTAL** | **184,400**
Tin stabilisers applications in the EU

- Calendered rigid films
- Extruded rigid sheets and profiles (compact and foamed)
- Others
  - Pipes
  - Fittings
  - Bottles
## Tin stabilisers main applications in the EU

<table>
<thead>
<tr>
<th>type</th>
<th>Application</th>
<th>Total Tin Stab. %</th>
<th>Total Tin Stab. tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigid</td>
<td>Calendered film</td>
<td>83.3</td>
<td>10.000</td>
</tr>
<tr>
<td>Rigid</td>
<td>Sheets &amp; profiles</td>
<td>12.5</td>
<td>1.500</td>
</tr>
<tr>
<td>Rigid</td>
<td>Others</td>
<td>4.2</td>
<td>500</td>
</tr>
<tr>
<td>Flexible</td>
<td>Flooring, wall covering</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total rigid</td>
<td></td>
<td></td>
<td>12.000</td>
</tr>
<tr>
<td>Total flexible</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>12.000</td>
</tr>
</tbody>
</table>
Tin Stabilisers

Classification & labelling
Classification & Labelling

- REACH is determining tin stabiliser use
- New Classification Labelling Packaging Regulation (CLP)
- Confusion on the market
  - Official/voluntary/ provisional/ transitional classifications
  - Old labels /new labels
REACH procedure in brief …

30,000 chemicals

R -> Chemicals with no hazard, and < 100 tonnes pa

Chemicals with hazard, and/or > 100 tonnes pa

E -> Chemicals with no risks, OK

Chemicals with extreme & defined hazard, e.g.:
• CMR I & II – (CMR 1a & 1b)
• PBT

Hazardous chemicals with risk

A -> Authorisation

Phase-out
Substances of very high concern under REACH

CMR

- Substances which are carcinogenic, mutagenic, toxic for reproduction category 1 and 2 are substances of very high concern under REACH
- Cat. 1:
  - Substances known to cause effects in humans.
  - Based on human epidemiological data
- Cat. 2:
  - Substances to be regarded as if they cause effects in humans.
  - Based on clear evidence in animal studies

PBT

- Substances which are persistent, bioaccumulative and toxic (PBT) - or very persistent and very bioaccumulative (vPvB) - are substances of very high concern under REACH
- Data allowing the PBT assessment of substances are required for each REACH registration dossier (by 2010)
Tin stabilisers under REACH

- Butyltins
- Methyltins
- Octyltins
Tin stabilisers under REACH

Butyltins

Monobutyltins
- No CMR classif.

Dibutyltins
- Repro. Cat. 2
- Muta. Cat. 3

REACH
- Authorisation
  - not an automatic process (need initiation of Annex XV dossier)
  - but sunset date already defined by COM Decision 2009/425/EC
Tin stabilisers under REACH

Butyltins

MethyItns

Octyltins
Tin stabilisers under REACH

Methyltins

Monomethyltins
- Repro. Cat.3
- Muta. Cat.3

Dimethyltins
- Repro. Cat.3

REACH ✓

www.stabilisers.org
Butyltins

Methy1tins

Octyltins
Tin stabilisers under REACH

- End 2009 full PBT testings have been achieved in accordance to Commission Regulation 465/2008
  - Mono and dioctyltins are far below the threshold of 2000 qualifying a molecule as Bioaccumulative and are therefore NOT PBT

- REACH
  - √

www.stabilisers.org
New Classification Labelling Packaging Regulation (CLP)

- Came into force on 20 January 2009
- Replace the DSD* and the DPD** in a stepwise approach during a transitional period
- Implements the Globally Harmonised System of classification and labelling (GHS) into EU law

*SD: Dangerous Substances Directive 67/548/EEC
**DPD: Dangerous Preparations Directive 1999/45/EC
CMR under CLP (GHS)

- CMR cat. 1 and 2 are translated in GHS as CMR cat. 1a and 1b

- CMR cat. 3 is translated in GHS as cat. 2 => always specify to which legislation cat. 2 refers to avoid confusion on this important point

- In GHS a new pictogram is associated to chronic toxicity instead of the Skull & cross-bones (previously applicable to both acute and chronic)
## Timeline GHS-EU

<table>
<thead>
<tr>
<th>Substances</th>
<th>01/2009</th>
<th>01/12/2010</th>
<th>01/12/2012</th>
<th>01/06/2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placed on Market before 01/12/2010</td>
<td>Classification</td>
<td>67/548 (or GHS)</td>
<td>67/548 and GHS</td>
<td>GHS</td>
</tr>
<tr>
<td>Labelling Packaging</td>
<td>67/548 (or GHS)</td>
<td>GHS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary Tin stabilisers under REACH

- **Butyltins**
  - Monobutyl
    - No CMR classif.
  - Dibutyl
    - GHS CMR cat. 1b
    - Authorisation

- **MethyIltins**
  - Not classified GHS CMR cat. 1a/1b
  - Not classified GHS CMR cat. 1a/1b

- **Octyltins**
  - Not classified GHS CMR cat. 1a/1b
  - Confirmation Not PBT
Tin Stabilisers

Restrictions of the marketing & use


(now REACH Annex XVII)
Marketing & use of organotins in the EU

- **Background**
  - Tributyltins issues (antifouling paints on ships)
  - EU Green paper on PVC in 2001
  - Risk Assessment on « organotins » commissioned by DG Enterprise in 2002 and finalised in 2008
  - One of the most complicated undertaken in the EU:
    - “Organotins” comprise a wide variety of substances
    - Selection of Tributyltins, Dibutyltins, DiOctyltins (Methyltins not evaluated)
    - Used as biocides, catalysts, **stabilisers**
    - In a wide variety of consumer applications
  - No risks identified for the use of DBT & DOT in tin stabilised rigid PVC
According to the Risk Assessment, “Organotin” applications as judged by Consumer exposure as a percentage of Tolerable Daily Intake.

The size of each application box approximately reflects the tonnage of use in Europe.
Restrictions adopted

- Tributyltins
  - Total Ban after 1 January 2010 in articles
- Dibutyltins
- Dioctyltins
Restrictions adopted

- Restriction of Dibutyltin in all applications within 3 years (until 1 January 2012)
- But with an exemption within 6 years for certain applications (until 1 January 2015), like in:
  - in soft PVC profiles whether by themselves or coextruded with hard PVC
  - fabrics coated with PVC containing DBT compounds as stabilisers when intended for outdoor applications
  - outdoor rainwater pipes, gutter and fittings, covering material for roofing and façades
Restrictions adopted

Dioctyltins

- All Dioctyltin applications allowed for use except specific restrictions for supply to, or use by the general public (after 1 January 2012) like in:
  - textile articles intended to come in contact with the skin
  - gloves
  - footwear or part of footwear intended to come into contact with the skin
  - wall and floor coverings
Practical implementation

- Complex interpretation – giving rise to questions and “green marketing”

- **ETINSA sheet**
  To help Downstream Users to find their way through the COM Decision (available upon request)

- **Official Journal of the European Union**
Q: I understand that diOctyltin cannot be used in application like wall covering after 1 January 2012 – does this cover siding?

A: No, it does not. Wall covering is a flexible PVC application. Siding is not listed as it is a rigid PVC application. The risk assessment has shown that there is no risk for use of diOctyltin in rigid PVC applications and there is therefore no restriction.
Summary Tin stabilisers under REACH + COM Decision 2009/425/EC

*Butyltins*
- Monobutyl
  - No CMR classification
- Dibutyl
  - GHS CMR cat. 1b
  - Authorisation

*Methylns*
- Not classified GHS CMR cat. 1a/1b
- Risk assessment completed

*Octylns*
- Not classified GHS CMR cat. 1a/1b
- Confirmation Not PBT
- Risk assessment completed

The Organotin Reach Consortium was formed in 2008 with all the major stakeholders of organotins compounds. Is on track to complete the registration dossiers within the deadlines.
Summing up

- Organotins as a group had to suffer the effects of the Tributyltin issues (biocides) but the results of the risk assessment and the restrictions of the M&U clarified the situation and is very helpful to stabilisers moving forward.

- Need to help DU implementing the EU Com decision – ETINSA can provide support.

- Regulatory certainty: No further actions are foreshen by EU Authorities on tin substances used in PVC stabilisers. Tin substances part of the three groups (Butyl, Methyl, Octyl) will be registered on time. Some are data rich (e.g. Octyltins).

- The move to GHS might introduce confusion especially during the transition period:
  - Always specify *to which legislation the classification used refers* (CMR cat. 3 is translated in GHS as cat. 2).
  - For many tin substances scull and crossbones will disappear.
Thank you

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