

Sustainability challenges for the Specialty Chemicals Industry in the E&E supply chain

A SUPPLIER'S VIEW (PIGMENTS, ADDITIVES, MASTERBATCHES)

Public

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what is precious to you?

Technical Trends / Challenges

- Miniaturization / thin section requirements
- Weight reduction
- Narrow specifications
(e.g. particle size distribution, impurities)
- High thermal stability requirements
(e.g. lead free soldering)
- Avoiding unwanted effects
(migration, contact corrosion etc.)
- Processability/handling of chemicals – industrial hygiene (e.g. dust free)
- Demanding material properties (mechanical, electrical)



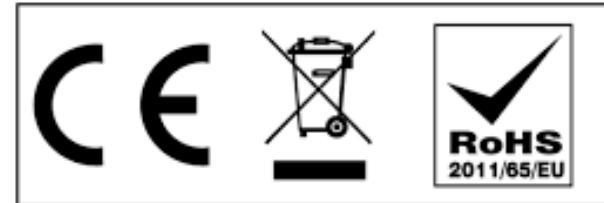
Technical trends are partially overlapping with sustainability requirements

Growing Regulatory Framework

- Registration of chemicals, especially new substances (REACH, TSCA and others ...)“China REACH” as a specific challenge – tox results prior to next step, costs, time
- Restriction of hazardous chemicals (e.g. ROHS in Europe)
Specifically challenging: substitution of SVHC candidates
- Globally Harmonized System – (CLP ordinance in Europe
- classification, labeling, packaging)
- Recycling regulations (e.g. WEEE in Europe)

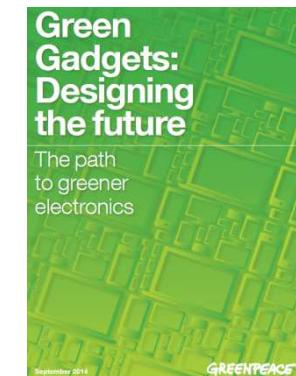


Compliance is key for suppliers !



Going Beyond Compliance

- Green Design initiatives (e.g. Design for the Environment)
- Self commitments of OEMs
- Life Cycle Analysis - Eco labels
- Influence of NGOs
- Black / White Lists of equipment manufacturers



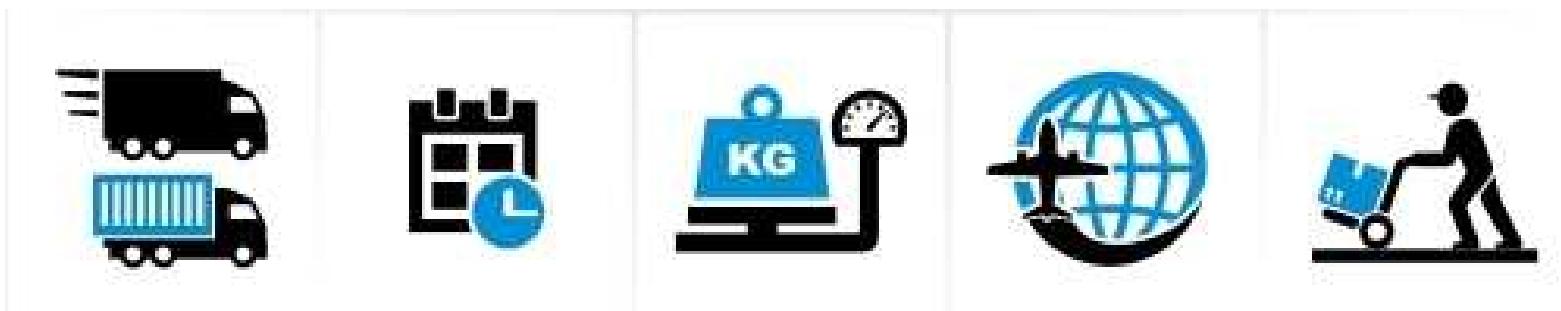
Example “Green Screen”- System (Clean Production Action, USA)



| DfE to GreenScreen Translations | Final Benchmark Scores |
|--|---|
| Antimony Trioxide (1309-64-4) | 1 = Avoid - chemical of high concern |
| Melamine Cyanurate (CAS# 37640-57-6)] | 1 = Avoid - chemical of high concern |
| N-alkoxy Hindered Amine Rx Products (CAS#191680-81-6) | 1 = Avoid - chemical of high concern |
| Phosphonate Oligomer (CAS#68664-06-2) | 1 = Avoid - chemical of high concern |
| Zinc Borate 1332-07-6, 138265-88-0 | 1 = Avoid - chemical of high concern |
| Aluminum diethylphosphinate (CAS#225789-38-8) | 2 = Use but search for safer alternatives |
| Aluminum Hydroxide (CAS#21645-51-2) | 2 = Use but search for safer alternatives |
| Melamine Polyphosphate (CAS#15541-60-3) | 2 = Use but search for safer alternatives |
| Poly[phosphonate-co-carbonate] (CAS# 77226-90-5) | 2 = Use but search for safer alternatives |
| Resorcinol Bis-Diphenylphosphate (CAS#125997-21-9) | 2 = Use but search for safer alternatives |
| Red Phosphorus (CAS# 7723-14-0) | 2 = Use but search for safer alternatives |
| Substituted Amine Phosphate mixture (CAS# 66034-17-1) | 2 = Use but search for safer alternatives |
| Triphenyl Phosphate (CAS#115-86-6)] | 2 = Use but search for safer alternatives |
| Ammonium Polyphosphate (CAS # 68333-79-9)] | 3 = Use but still opportunity for improvement |
| Magnesium Hydroxide (CAS # 1309-42-8)] | 3 = Use but still opportunity for improvement |
| Polyphosphonate (CAS#68664-06-2) | 3 = Use but still opportunity for improvement |
| Bisphenol A Bis-(diphenyl phosphate) (CAS#181028-79-5 and 5945-33-5) (BAPP) | U = not enough data for assessment |
| Phosphoric acid, mixed esters with [1,1'-bisphenyl-4,4'-diol] and phenol; BPBP (CAS#1003300-73-9)] | U = not enough data for assessment |
| | 4 = Prefer - safer chemical |

Implications for the E&E Supply Chain

- Enormous complexity with regard to applications as well as compliance
- More collaboration / transparency along the value chain is requested
- Traceability of chemical products as a growing need
- Standardized data transfer is a challenge for Product Stewardship departments
- Sustainability requests add more information needs (LCA data, “footprints”)
- “Green Design” as a new challenge in product development
- Substitution of chemicals based on hazard/risk assessments



The Way Forward at Clariant Examples

- “Add value with Sustainability” as a strategic pillar within the company
- Establishing a “Portfolio Value Program” for more sustainable products:
 - Portfolio screening with an extensive criteria catalogue
 - Categorization of products / product groups according to the screening results
 - Road maps for portfolio improvement
 - Labelling of flagship products (“EcoTain”)
- Creating more data on the life cycle performance of products
 - Example: EU project ENFIRO on alternatives for specific brominated flame retardants
(LCA of flame retardants used in a laptop computer)

