



HDP User Group International, Inc. Halogen Free (HF) Product Properties Database Project



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Materials Regulations Are Increasing...



Major Regulations

Effective Today



Future Regulations With Emphasis on Halogen Restrictions

- California Prop 65
- EU RoHS
- Japan RoHS
- California RoHS
- China RoHS (labeling)

- EU “RoHS Plus” or “RoHS 2.0”- exemption sunsets, possibility of additional restricted substances by 2012
- EU REACH – public disclosure of chemical content by 2009-11
- US and EU country regulations (ex: Norway proposing bans as early as 2008)

Current Industry Halogen-Free Projects



| Project Title | Project Chair(s) | Key Objectives | Expected Completion Date |
|--|------------------|---|---|
| US EPA - Flame Retardants in Printed Circuit Boards | EPA | Identify and evaluate commercially available flame retardants and their environmental, human health and safety aspects. | Finalize report – mid-2008 |
| HDPUG - Halogen-Free Properties | Dell | Develop a comprehensive Halogen-Free Guideline and Halogen-free Materials Database. | Guideline – early-2008 Database – late-2008 |
| iNEMI Halogen-Free PCB Project | Intel / IBM | <ul style="list-style-type: none"> • Build on industry knowledge and capability • Identify HF PCB technology readiness and gaps • Stimulate supply capability • Recommend standards development opportunities | Industry Report – APEX – February 2008 |
| IPC – Halogen-Free Subcommittee | Dell / Intel | Develop a new halogen-free system level standard (define maximum concentration values for halogens across a variety of applications) | Joint IPC / JEDEC Standard – February 2008 (APEX) 3 |

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Proprietary

Why a Halogen-Free Project in HDPUG?



- Halogens are used in a wide variety of applications, therefore holistic halogen-free solutions are needed
- It would be beneficial for all HDPUG members and others in the industry to have easy access to key pieces of information regarding:
 - Information on availability of halogen-free components/parts (suppliers, part type, etc)
 - Properties of halogen-free materials (regulatory approvals/ratings, electrical & mechanical properties, etc)
- Halogen-free PCBs and components have different properties and characteristics than halogenated PCB's and components. The properties of the HF materials are not readily available in a format and measurement method that is consistent.
- HDP User Group has had some previous projects in halogen free alternatives that can be leveraged.

HF Properties Project – Task Teams



The project is divided into 2 teams:

1. HF Guideline Team – determine the content and format of the HF Guideline, provide and solicit input, and produce the final document for posting on the HDPUG website.
 - **Project now in Implementation Phase.**

2. HF Database Team – will define the format of the Supplier data, the specific properties to be reported, and the test method to be used to measure the data. Prepare a list of potential suppliers and contact them for inclusion, and monitor and adjust the database as it begins to form.
 - **Project now in Definition Phase**

Transition Plan – HF Guideline to HF Database



HF Guideline



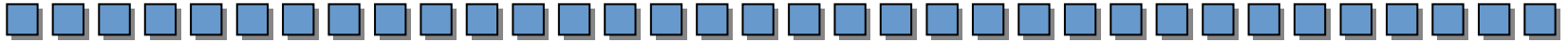
HF Database

- **The following sections of the Guideline must be completed to begin the Database work:**
 1. Summary of key legislation & standards - **complete**
 2. Listing of relevant flame retardants & properties - **complete**
 3. Listing of properties to be captured in the database for various HF materials (UL rating, ISO code, dielectric constant, dissipation factor, moisture absorption, thermal expansion, thermal conductivity, etc)- **in progress, complete by 11/1**

- **Take Guideline and develop a mock-up database template by early 2008**
 - Pilot in mid-2008
 - Go live in late-2008



HF Database Schedule



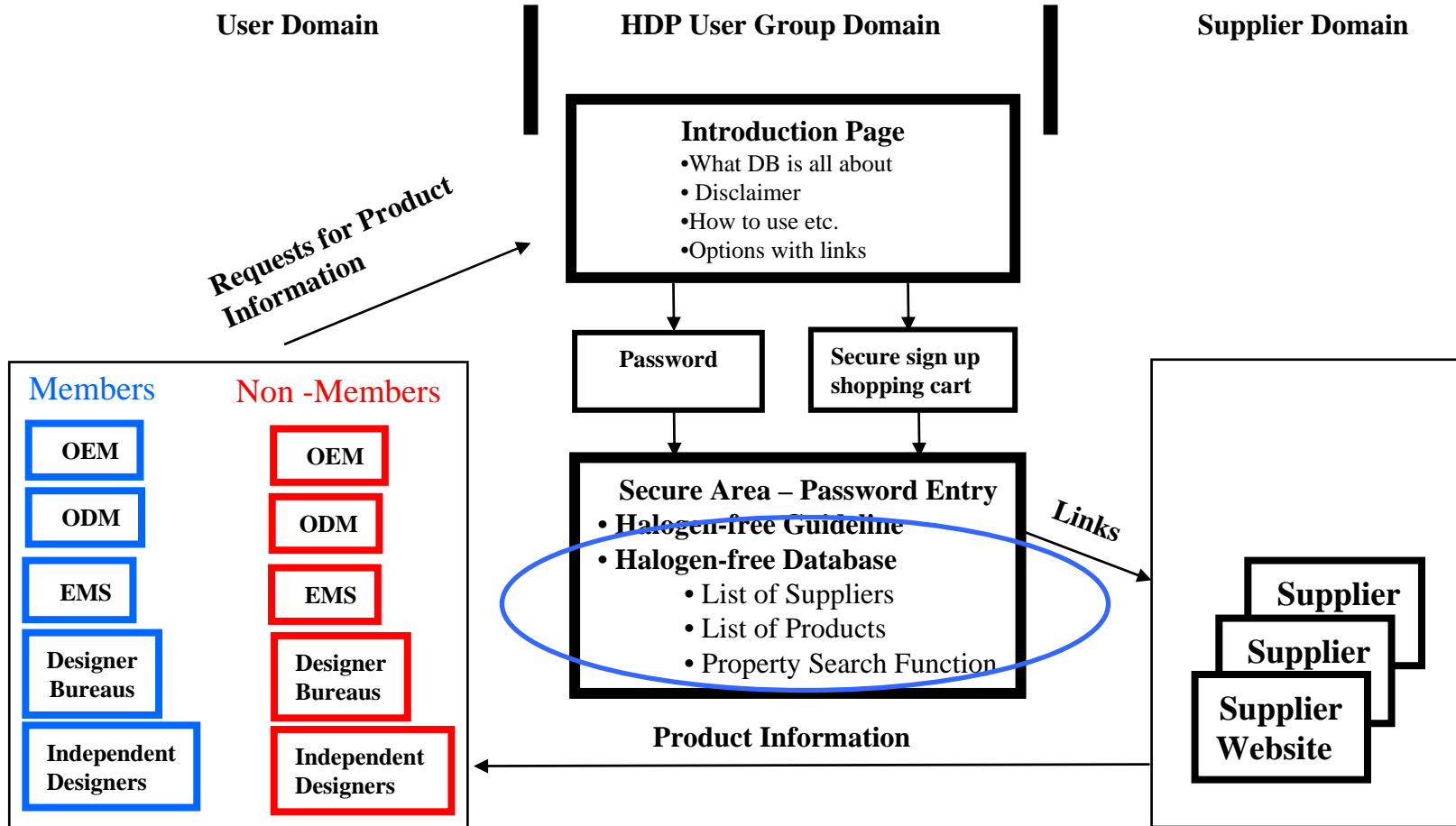
| Project Task | When Complete | Actual (Implementation Stage only) |
|---|----------------|---------------------------------------|
| Plan Project | 3/1/07 | X |
| Steering committee identified and roles defined | Oct '07 | |
| Project moves into Implementation stage | Jan '08 | |
| Categories & test methods identified and prioritized, by commodity | Feb '08 | |
| Mock-up data format and layout complete | Apr '08 | |
| Pilot database established with links to first Suppliers/request feedback on database | May '08 | |
| Letter of invitation prepared and sent to Suppliers | July '08 | |
| Final presentation page format established | Sept '08 | |
| Testing by HDP Members | Oct '08 | |
| Database open to industry (updated monthly) | Dec '08 | |

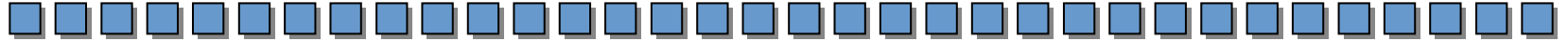
What's in the HF Database?



- Likely categories to include in the HF database (volunteer needed for each):
 1. PCB base materials: solder masks, fluxes, laminates, etc
 2. Component base materials: mold compounds, substrate laminates, etc
 3. Connectors
 4. Cables
 5. Mechanical plastic resins
 6. Films, labels, etc
- Listing of halogen-free commodities, including basic information such as:
 - Supplier name
 - Model number/part number
 - UL rating, if applicable
 - Resin coding/FR coding (per ISO standard)
 - Br/Cl level (ppm)
 - Link to supplier website
- In addition, specific commodities will have specific data relevant for halogen-free:
 - Ex: PCBs will have Tg values, cables will not

HF Product Database System Overview

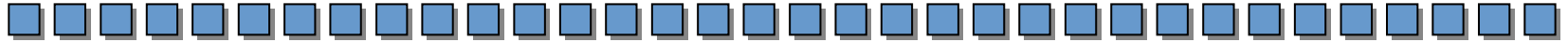




Back-Up



Current Team Members – Any Others?



- Jack Fisher HDPUG staff
- Marshall Andrews HDPUG Staff
- Ruben Bergman HDPUG staff
- Laurence Schultz HDPUG staff
- Mike Loo AMD
- Donna Sadowy AMD
- Jerome DeBoysere Clariant
- Adrian Beard Clariant
- Scott O'Connell Dell
- Art Fong IBM
- Wayne Rothschild IBM
- Paris Dieker HP
- Hans Wendschlag HP
- Harry Witschas Fujitsu-Siemens
- Mark Buczek Supresta
- Sergei Levchik Supresta
- Susan Landry Albemarle
- Brian Carter Albemarle
- Louis Lin Nan Ya
- Bruce Sorenson Nan Ya
- Silvio Bertling Park Nelco
- Kathleen Vokes EPA
- Paul Collander Poltronic
- Doug Sober Kaneka Texas
- Erik Bergum Isola
- Ed Kelly Isola
- Fandy Wei Isola
- Gary Hoeppe Coretec
- Dave Bender Tyco
- Jeff Toran FCI
- Pete Elmgren Molex

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