Agenda

Brief history of Sustainable Product

Buy-in from CEO

Current Work on Banned Materials

Case Study with Asahi Kasei
What it is

is to

AS

is to

level

U.S. GREEN BUILDING COUNCIL
USGBC

Green-e

FSC

REEGUARD

Healthy Building Housing

 wouldn't happen
Four Sustainability Categories

PRODUCT
- 100% Safe Materials
- 100% Sustainable Wood
- End of Life Management

ACCOUNTABILITY
- Reduction in Energy Use
- Zero Waste Initiatives
- LEED/Building Certifications
- Green Transportation

KNOWLEDGE
- CEUs/Knowledge Series
- Transparent Reporting
- Customer Performance
- Internal Education

PEOPLE
- Volunteer Hours
- Continuing Education
- Safety
- Health (IAQ)
- Supplier Code of Conduct
Revised Goals:
100% Safe Materials globally (Long Term)
Banned list of 56 materials by 2018
100% Sustainable Wood Sources (globally)
FSC certification (AP&NA), PEFC for EU
End of Life responsibility
Goal in development

Activities:
Chemical Disclosures
Product Certification
<table>
<thead>
<tr>
<th>Material/Use</th>
<th>Concern</th>
<th>Trend</th>
<th>Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brominated/Halogenated Flame Retardants</td>
<td>Persistent, Bioaccumulative, &amp; Toxic throughout value stream including to Haworth members and our customers</td>
<td>TB133 (fire code) Increasing regulation, Negative public perception, customer banned</td>
<td>Phosphate based, non-halogenated</td>
</tr>
<tr>
<td>Hexavalent Chrome</td>
<td>Supply Chain toxin</td>
<td>Customer banned Heavy regulation</td>
<td>Tri-valent</td>
</tr>
<tr>
<td>Benzidene Dyes (Fabrics)</td>
<td>Supply Chain toxin</td>
<td>High regulation, customer banned</td>
<td>Eliminate. Dozens of readily available alternatives.</td>
</tr>
<tr>
<td>Material Enhancers (e.g. phthalates)</td>
<td>Value Chain Toxin (supply, mfg, use, and disposal)</td>
<td>Increasing regulation, customer banned</td>
<td>Eliminate.</td>
</tr>
<tr>
<td>PVC &amp; chlorinated polymers (T-Mold, Raceway Covers, Adhesives)</td>
<td>Supply chain &amp; recycling toxin</td>
<td>LEEDv4, ban in Germany, customer bans</td>
<td>ABS, PP, PE, Nylon, or other engineering solutions</td>
</tr>
<tr>
<td>Heavy Metals</td>
<td>Supply chain &amp; recycling toxin</td>
<td>EU</td>
<td>eliminate</td>
</tr>
</tbody>
</table>
Materials of Concern Decision Matrix

Toxicity Impact

High

Banned

BIFMA Chemicals

Red Listed Chemicals

Low

Cost <0.5% impact on GP
Fast Follower
Optional accessory
Client Requirement
New Market Opportunity

Cost >Y% impact on GP
Industry Innovative
Necessary Function
Client Preference
Existing Product

Business Impact (Competing Values)

- Hex-Chrome in Caster ($0.125/chair, $85k/yr)
- HCFC in Very Fixed Arms
- PVC Unigroup Raceway (> $1M/yr)
- Red COC chemical in Compose Electrical
- Formaldehyde

- Client Requirement
- New Market Opportunity
- Optional accessory
- Fast Follower
Safe Materials

Goal: 100 percent safe materials by 2020
• Identify 56 banned materials in product
• Develop clean material continuums

Banned Chemicals Identified
• Cal 133 Barrier Cloth
• PVC Raceway Covers
• PVC End Caps & Tapes
• PVC T-Mold
• PVC Modesty Panels
• Hex-Chrome in Casters
• HCFC in Very Arm Caps
• and others...
Safe Materials Activities

Process

- Identify harmful (emphasis on banned) materials
  Internal review
  Supplier disclosure (100 ppm)

- Review Supplier disclosure

- Find clean(er) alternatives

- Cost & Engineering analysis of alternatives

- Address tooling & supply chain criteria

- Implement

Goals:

- 100% Safe Materials
- 100% Sustainable Wood
- End of Life Management
Stakeholder Engagement

Supply Side
  Tier 1-6
  Chemical disclosures
  Intellectual Property

Design Community
  Certifications
  Transparency

Client
  Certifications (e.g. LEED)
  Carbon Footprinting
What would help?

Centralized data base for raw material suppliers disclosures

Stringent rules/enforcement for developing countries

Convergence of certifications & validations

Clearing house of alternatives

Avoid the attempt to boil the ocean
Group Mission

We, the Asahi Kasei Group, contribute to life and living for people around the world.

This is the Asahi Kasei Group’s unchanging reason for being. What we never cease to strive for, though the needs of society change throughout the ages. It is in our very nature, deriving from a sincere regard for the people of the world.

Group Vision

Providing new value to society by enabling “living in health and comfort” and “harmony with the natural environment.”

Group Values

Sincerity—Being sincere with everyone.
Challenge—Boldly taking challenges, continuously seeking change.
Creativity—Creating new value through unity and synergy.

Group Slogan

Creating for Tomorrow

The commitment of the Asahi Kasei Group:
To do all that we can in every era to help the people of the world make the most of life and attain fulfillment in living.
Since our founding, we have always been deeply committed to contributing to the development of society, boldly anticipating the emergence of new needs.
This is what we mean by “Creating for Tomorrow.”
Core Operational Segments:

- Chemicals
- Homes
- Health Care
- Fibers
- Electronics
- Construction Materials
- Services, Engineering & Others

Pioneering Innovations Through Application Development
Reduction of Hazardous Chemicals

- Regional / Local Chemical Safety Laws
- Customer Protocols on Hazardous Chemicals
- Regulatory Protocols
- Country, Federal & State Laws
- EPA, DEQ, NAFTA, REACH, RoHS
- NSF, UL, KTW, WRAS, Etc.
- Industry Segment Protocols like BIFMA
- Employee Safety Initiatives
Minimizing Chemical Impact

- Developing products with safe chemical footprint
  - Example: Polyamide → Polyolefin, PVC → PPE,
    Halogen FR → Non-Halogen FR, Paint Elimination
- Recycled products (re-purposing)
- Development of Bio-Resin products for safe-use
  - Example: Plastics from castor-bean seeds (non-food grade)
- Bio-Fillers instead of inorganic raw materials
- Development of low VOC products
- Mono-material concept
Managing Chemical Substances

Chemical substance management flow

Asahi Kasei Group

- Green Procurement
- Environmental protection: Reduction of environmental burden
- Operational safety: Prevention of fires and explosions
- Physical distribution safety: Provision of Transport Emergency Cards
- R&D
- Product safety: Receipt of MSDSs for materials
- Workplace safety and hygiene: Prevention of workplace injuries
- Distribution of MSDSs for products

Supply → Material → Procurement → Production → Sale → Product → Use → Disposal

Supplier

Customer
Additional Costs

- Changing chemical lists
  - Safer → Non-Halogen FR → 3-4xs original cost
  - 2 years to develop → $75K UL re-approvals
  - CA → just put on concern list ??? Frustrating

- Anti-scratch additives
  - Developed product for Auto Ind. → multiple supplier sources
  - On concerned list for Furniture → single supplier source → 3xs original cost
Concerns

- Lack of unified chemical substance list
  - Different markets, segments and customers
- Hampers product development & production efficiency
- Additional cost in our supply chain
- Changing chemical lists add uncertainty
- Design complexity due to unavailability of safer / economical alternatives
- Intellectual property concerns of manufacturer
- Lack of awareness in downstream supply chain (chemical substances on different lists)