CLEAN PRODUCTION ACTION

HEALTHY BUILDING NETWORK

Clean Production Action and Healthy Building Network
Chemicals of High Concern – List of Lists ("Red List of Lists")

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Chemicals of High Concern are a select group of chemicals that are the highest priority to eliminate from usage. In the Green Screen for Safer Chemicals[*] and the Pharos Project[†], chemicals of high concern have one or more of the following attributes, they are:

- Persistent, Bioaccumulative and Toxic (PBT),
- very Persistent and very Bioaccumulative (vPvB),
- very Persistent and Toxic (vPT)
- very Bioaccumulative and Toxic (vBT) or
- known or likely to be:
    - carcinogenic,
    - mutagenic,
    - reproductive or developmental toxicant,
    - neurotoxicant or
    - endocrine disrupting.

Our initial step to identifying chemicals that have these attributes begins from chemical lists developed by government entities. To generate the Clean Production Action (CPA) and Healthy Building Network (HBN) "Chemicals of High Concern – List of Lists" or "Red List" for short, we start from authoritative chemical lists developed by a body established by one or more government entities addressing any one of the hazard endpoints listed above.

Authoritative lists for all of the above endpoints – excepting neurotoxicants, vPTs, vBTs and endocrine disruptors – are provided below. No authoritative government lists currently exist for neurotoxicants, vPTs and vBTs and endocrine disruptors. For endocrine disruptors, the government lists are preliminary screening lists that identify chemicals that are prime candidates for the high concern label, but are in need of further assessment before they can be assigned with certainty. Since neurotoxicity and endocrine disruption are endpoints of high concern, we provide "watch" lists to flag chemicals that may meet these criteria. While these chemicals are under assessment, precautionary avoidance is warranted.

It is important to note that the authoritative lists are based on evaluation of only a limited set of the approximately 80,000 chemicals in commerce. Many chemicals have simply not been tested. Therefore it is important to assess the available toxicological literature on chemicals which are not listed and to use modeling tools and analogs to determine whether the weight of evidence indicates that a chemical is a chemical of high concern. The authoritative and watch lists that follow provide a starting point for identifying chemicals of high concern.

[*] M Rossi and L Heine, 2007, *Green Screen for Safer Chemicals* -- www.cleanproduction.org/Green.Greenscreen.php
[†] Healthy Building Network, *Pharos Project* -- www.pharosproject.net.

Persistent, Bioaccumulative and Toxic (PBT) Substances

1. United Nations Environment Programme (UNEP), Stockholm Convention Secretariat Stockholm Convention on Persistent Organic Pollutants (POPs)
   Source: For the list of 12 POPs under the convention, see: http://chm.pops.int/Convention/12POPs/tabid/296/language/en-US/Default.aspx (accessed 10/23/2008); and for chemicals in review process, see: http://chm.pops.int/Convention/POPsReviewCommittee/RecommendationsofthePOPRC/tabid/440/language/en-US/Default.aspx (accessed 01/29/2009).

2. US Environmental Protection Agency (EPA), Toxics Release Inventory (TRI) Program, "TRI PBT Chemical List"
   Source: http://www.epa.gov/triinter/trichemicals/pbt%20chemicals/pbt_chem_list.htm (accessed 1/26/09).

3. US Environmental Protection Agency (EPA), Persistent Bioaccumulative and Toxic (PBT) Chemical Program, Priority PBT Profiles
   Source: http://www.epa.gov/opptintr/pbt/pubs/cheminfo.htm (accessed 10/23/2008).

4. US Environmental Protection Agency (EPA), National Waste Minimization Program, Priority Chemicals
   Source: http://www.epa.gov/epawaste/hazard/wastemin/priority.htm (accessed 10/23/2008).

5. European Union, European Chemicals Bureau, European Chemical Substances Information System (ESIS) PBT list
   Source: http://ecb.jrc.it/esis/index.php?PGM=pbt (accessed 10/23/2008).

6. State of Washington, Department of Ecology, Chapter 173-333 WAC Persistent Bioaccumulative Toxins
   Source: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-333-310 (accessed 1/26/09).

very Persistent and very Bioaccumulative (vPvB) Substances

1. European Union vPvB list (vPvB's are included in the PBT list). See European Union, European Chemicals Bureau, European Chemical Substances Information System (ESIS)
   Source: http://ecb.jrc.it/esis/index.php?PGM=pbt (accessed 10/23/2008).

Carcinogenicity

1. US National Institutes of Health, National Institute of Environmental Health Sciences, National Toxicology Program (NTP), Report on Carcinogens (ROC)
   a. Known to be Human Carcinogens
   b. Reasonably Anticipated to be Human Carcinogens
   Source: http://ehis.niehs.nih.gov/roc (accessed 10/23/2008).

2. US Environmental Protection Agency (EPA), National Center for Environmental Assessment, Integrated Risk Information System (IRIS) Database
    a. 1999 and 2005 Guidelines:
        i. "Carcinogenic to humans"
        ii. "Likely to be carcinogenic to humans"
    b. 1996 Guidelines: "Known/likely human carcinogen"
    c. 1986 Guidelines:
        i. "Group A - Human Carcinogen"
        ii. "Group B1 - Probable human carcinogen"
        iii. "Group B2 - Probable human carcinogen"

    Source: http://www.epa.gov/ncea/iris/search_human.htm (accessed 10/23/2008).

3. International Agency for Research on Cancer (IARC), Agents Reviewed by the IARC Monographs
    a. Group 1: Agent is carcinogenic to humans
    b. Group 2A: Agent is probably carcinogenic to humans

    Source: http://monographs.iarc.fr/ENG/Classification/index.php (accessed 10/23/2008).

4. State of California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act Of 1986) Chemicals Known to the State to Cause Cancer or Reproductive Toxicity

    Source: http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html (accessed 10/23/2008).

5. European Commission, Enterprise and Industry DG, Carcinogens List – See consolidated version of Annex I of Directive 76/769 EEC, which includes Annex I of Directive 65/548/EEC (which is to be replaced by Annex XVII of REACH on 1 June 2009).
    a. Carcinogen Category 1: "known"
    b. Carcinogen Category 2: "should be considered carcinogenic to humans"

    Source: http://ec.europa.eu/enterprise/chemicals/legislation/markrestr/index_en.htm (accessed 10/23/2008).

6. European Commission, Joint Research Centre (DG JRC), Institute for Health and Consumer Protection (IHCP), Consumer Products Safety & Quality (CPS&Q) Unit, Substances with EU Risk & Safety Phrases (Commission Directive 67-548-EEC)
    a. R45 "May cause cancer"
    b. R49 "May cause cancer by inhalation"

    Source: http://ecb.jrc.it/documentation/ (click on: "DOCUMENTS", "CLASSIFICATION-LABELLING", "DIRECTIVE 67-548-EEC", "ANNEX I OF DIRECTIVE 67-548-EEC", and then either of the files listed as: "Annex I of Directive 67548EEC") (accessed 10/23/2008).

7. National Institute for Occupational Safety and Health (NIOSH) Carcinogen List

    Source: http://www.cdc.gov/niosh/topics/cancer/npotocca.html (accessed 1/26/09).

Mutagenicity

1. European Commission, Enterprise and Industry DG, Mutagens List – See consolidated version of Annex I of Directive 76/769 EEC, which includes Annex I of Directive 65/548/EEC (which is to be replaced by Annex XVII of REACH on 1 June 2009).
    a. Mutagen Category 1: "Substances known to be mutagenic to man"
    b. Mutagen Category 2: "Substances which should be regarded as if they are mutagenic to man"

    Source: http://ec.europa.eu/enterprise/chemicals/legislation/markrestr/index_en.htm (accessed 10/23/2008).

2. European Commission, Joint Research Centre (DG JRC), Institute for Health and Consumer Protection (IHCP), Consumer Products Safety & Quality (CPS&Q) Unit, Substances with EU Risk & Safety Phrases (Commission Directive 67-548-EEC)
    a. R46 "May cause heritable genetic damage"

    Source: http://ecb.jrc.it/documentation/ (click on: "DOCUMENTS", "CLASSIFICATION-LABELLING", "DIRECTIVE 67-548-EEC", "ANNEX I OF DIRECTIVE 67-548-EEC", and then either of the files listed as: "Annex I of Directive 67548EEC") (accessed 10/23/2008).

Reproductive / Development Toxicity

1. European Commission, Enterprise and Industry DG, Reproductive Toxicants List – See consolidated version of Annex I of Directive 76/769 EEC, which includes Annex I of Directive 65/548/EEC (which is to be replaced by Annex XVII of REACH on 1 June 2009).
    a. Reproduction Category 1: "known" to impair fertility in humans or cause developmental toxicity in humans"
    b. Reproduction Category 2: "should be regarded as if" they impair fertility to humans or cause developmental toxicity to humans"

    Source: http://ec.europa.eu/enterprise/chemicals/legislation/markrestr/index_en.htm (accessed 10/23/2008).

3. European Commission, Joint Research Centre (DG JRC), Institute for Health and Consumer Protection (IHCP), Consumer Products Safety & Quality (CPS&Q) Unit, Substances with EU Risk & Safety Phrases (Commission Directive 67-548-EEC)
    a. R60 "May impair fertility"
    b. R61 "May cause harm to the unborn child"

    Source: http://ecb.jrc.it/documentation/ (click on: "DOCUMENTS", "CLASSIFICATION-LABELLING", "DIRECTIVE 67-548-EEC", "ANNEX I OF DIRECTIVE 67-548-EEC", and then either of the files listed as: "Annex I of Directive 67548EEC") (accessed 10/23/2008).

4. State of California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act Of 1986), Chemicals Known to the State to Cause Cancer or Reproductive Toxicity

    Source: http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html (accessed 10/23/2008).

5. US National Institutes of Health, National Institute of Environmental Health Sciences, National Toxicology Program (NTP), Center for the Evaluation of Risks to Human Reproduction. Expert Panel Reports & Monographs on Reproductive and Developmental Toxicity. Review monographs to identify chemicals of high concern.

    Source: http://cerhr.niehs.nih.gov/chemicals/index.html (accessed 10/23/2008).

Neurotoxicants

Neurotoxicant Screening List. Chemicals listed in the article below are potential Red List chemicals. Precautionary avoidance is warranted.

Grandijean, P & PJ Landrigan. 2006. "Developmental neurotoxicity of industrial chemicals." *The Lancet*, v.368: 2167-2178. List of 201 Chemicals known to be neurotoxic in humans.

Endocrine Disruptors

Endocrine Disruptors Screening List. Chemicals listed in the European Union documents below are potential Red List chemicals. Precautionary avoidance is warranted.

1. European Union, Category 1 ("at least one in-vivo study providing c*lear evide*nce for endocrine disruption in at least one species using intact animals"), Endocrine Disruptor chemicals. SCREENING LISTS – potential Red List chemicals, still undergoing assessment.

    Sources:

    a. DHI. 2007. Study on Enhancing the Endocrine Disrupter Priority List with a Focus on Low Production Volume Chemicals. http://ec.europa.eu/environment/endocrine/documents/final_report_2007.pdf
    b. Commission Staff Working Document on the implementation of the "Community Strategy for Endocrine Disrupters" - a range of substances suspected of interfering with the hormone systems of humans and wildlife (COM (1999) 706), (COM (2001) 262) and (SEC (2004) 1372) (Brussels, 5 December 2007). http://register.consilium.europa.eu/pdf/en/07/st16/st16123.en07.pdf -- (accessed 6/9/08).