



Hazardous chemicals in flooring

Flooring products must be durable, aesthetically pleasing and easy to maintain. They must also be safe. The manufacture and maintenance of flooring products relies heavily on the use of chemicals. These can bring substantial performance and safety benefits, e.g. plasticisers, fire retardants, antimicrobials, pesticides, stabilisers, stain repellents and cleaning agents. However there have been some serious safety issues concerning their use and disposal. Globally the sheer scale of use of industrial chemicals, and the growing evidence of their negative environmental impacts, means that they are becoming unsustainable and in need of tighter control. Until recently nobody could guess at how many chemicals were being used, and only a few hazardous chemicals are legally restricted. In total around 300 synthetic chemicals have been found in humans and are linked to illnesses such as cancer, diabetes, heart disease, psychiatric disorders, Parkinson's and Alzheimer's diseases, infertility and obesity.

The UK has a standing Royal Commission on Environmental Pollution and in 2003 the Commission Chairman, Sir Tom Blundell, said the following:

"Given our understanding of the way chemicals interact with the environment, we are running a gigantic experiment with humans and all other things living."

A group of chemicals known collectively known as Persistent Organic Pollutants (POP's) are the focus of international concern. These are chemicals which do not break down easily and which remain in the environment for a long time. They are carried on the wind and the oceans and are detectable in tropical forests, marine systems, and even the Arctic. POP's transfers through the food chain and significant levels have been found in humans and animals. POPs include pesticides, and organochlorines used in industrial processes for the manufacture of PVC, solvents, fire retardants and stain repellents. Uncontrolled incineration of these finished products, and manufacturing bi-products, can produce highly toxic dioxin compounds which have been associated with a number of environmental disasters, including the long term adverse health outcomes from the 2001 World Trade Centre attacks. A global treaty under the Stockholm Convention is now in place which aims to protect human health and the environment from POP's.

Potentially hazardous chemicals, know as VOC's (Volatile Organic Compounds), such as formaldehyde, are present in flooring products as well as in insulation, chipboard and wood panel adhesives. VOC's are detectable in the air in buildings at levels above those that occur from background atmospheric levels caused, for example, by forest fires and car exhausts. As buildings become more air tight and energy efficient, ventilation of these emissions will

reduce. There is no agreement on what levels are safe and clinical evidence about the dangers they pose remains somewhat inconclusive. However there is enough evidence that formaldehyde may be carcinogenic to warrant action. Although formaldehyde is not subject to control under the building regulations, the BREEAM scheme looks for flooring products to meet the E1 testing standard which seeks to limit indoor air concentration to less than 0.1 ppm. While this is a harmonised European Standard, the Construction Product Regulations allow member countries to form their own view on what VOC levels may cause harm. In Germany the AgBB, a task force of public health authorities, has set a much lower limit than E1 for flooring products and is pushing to see this implemented across Europe.

The most ambitious response to the need for knowledge about and control of chemicals has come from the EU through complex legislation known as the REACH Regulations (Registration, Evaluation and Authorisation of Chemicals). This enormous undertaking is administered by the European Chemicals Agency (ECHA) based in Helsinki. The first stage was the enforced registration of most chemicals manufactured or imported into Europe. The ECHA experts predicted the registration of around 30,000 substances. There were actually over 140,000! Someone is now held responsible for the hazard identification and risk assessment of all registered substances in a process which will continue until 2018. Some chemicals of concern have been through toxicology testing; however this testing was not necessarily complete or shared. This will change and a dossier of specific testing data will be prepared for all substances where this is thought to be justified. A list of Substances of Very High Concern (SVHC's) has been published. This list has grown from around 17 substances to nearly 100 which are likely to be severely restricted or withdrawn from the market. There are other lists of suspect chemicals produced by influential NGO's and Trade Unions. These include the "Substitute It Now" (SIN) List from ChemSec www.chemsec.org, which lists around 300 substances they wish to see added to the SVHC list. Some of these are chemicals used in flooring. Although many have been phased out, the recycling of post consumer flooring may be affected by the need to notify customers if any article, e.g. a recycled PVC traffic cone, has any SVHC content above 0.1%.

Growing awareness of the Stockholm Convention, REACH, environmental disasters and of class actions for damages has brought chemicals manufacturers under particular scrutiny by investment institutions. Listed companies need investment from major institutions, and having a sustainable profile is now a key business issue. The ratings agency Oekom recently published their analysis of the track record and future prospects of 100 chemical companies. Only a few emerged with encouraging ratings and these include BASF, Braskem, Akzo Nobel and Symrise. The chemicals industry is heavily oil dependent and many are searching for alternative and renewable raw materials such as starches, sugar and cellulose. These are increasingly being used to manufacture plastics and may also, for example, offer a greener alternative to latex adhesives.

There is a growing acceptance among companies who have in the past relied on chemicals manufacturers, that they need to learn a lot more and do a lot more themselves to protect their brands. I am involved in a network which includes Shaw Industries, B & Q, Boots, Ikea, Dell, Sony Mobile, L'Oreal and Skanska. They have joined together with Chemsec to learn and share ideas on hazardous chemicals management policies and substitution strategies. Chemsec are also parties to the provision of an EU funded substitution resource to industry

known as “SubSport” (www.subsport.eu). This is free to use and has around 200 hazardous chemical substitution case studies.

Some flooring products come with environmental certification which includes chemical safety criteria. However in the UK we tend to focus heavily on BRE ratings to satisfy BREEAM and the Code for Sustainable Homes. In my view these do not focus sufficiently on hazardous chemicals. Some flooring companies including Forbo, Shaw, Desso and Tarkett have introduced Cradle to Cradle® certified products which meet stringent chemicals safety requirements. Voluntary Eco Labels such as Blue Angel, Nature Plus, GUT, EMICODE, CRI Green Label Plus etc. also give useful assurance on chemical safety and I expect their use to increase. I found the Good Environmental Choice Australia – Environmental Standard for Carpets and Adhesives to be particularly strong in this area. If you are interested their criteria may be seen at www.geca.org.au.

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