

### **Product design for the environment**

There are inherent difficulties in designing flooring products which will satisfy the green agenda. These fundamentally arise from key performance criteria. Flooring must achieve a combination of desirable surface characteristics, durability and overall aesthetic effect within a target price. All of these criteria have led to reliance on robust raw materials and manufacturing methods which have been proven to meet product performance standards and to be commercially viable over a considerable period of time.

However as the green agenda has developed, and is now a key market driver for commercial installations, additional sustainability criteria are being factored into buying decisions. For example there is now considerable tightening of standards required for indoor air quality and minimisation of hazardous chemical compounds both in the flooring products themselves and during manufacture. It is, for example, likely that levels of emissions of formaldehyde from products currently permissible under the BREEAM scheme and around Europe generally will reduce significantly. This is as a result of market demands in places such as Germany and California and is driving the search for very low VOC products. New virtually VOC free adhesive systems are already emerging such as Shaw's "Lokdots®" "innovation for carpet tile installation and Interface's adhesive free "TacTiles®" system. In addition concerns over the long term safety of chemicals such as PVC are growing. Interface have recently announced a gradual withdrawal from the use of PVC as a carpet tile backing having bowed to the arguments presented by numerous green organisations around the world.

As a result of these pressures manufacturers are responding and specifiers are looking again at some older materials which are undergoing a new lease of life. In Europe the choice of resilient flooring is between PVC, linoleum and rubber. Neither linoleum nor rubber contains chlorine or phthalate softeners which are responsible for most of the inherent safety concerns with PVC. Linoleum is perhaps limited in its global supply potential and is not suitable for all installations. In the past there have been maintenance and emissions problems as linoleum has absorbed moisture and staining and has oxidised becoming brittle with wear. However newer versions come with protective coatings and ecolabels certifying their safety and durability characteristics such as Forbo's "Marmoleum®". These new linoleum offerings may now be seen as a viable green alternative to vinyl. Rubber flooring can be similarly attractive if the use of potentially toxic recycled tyre content is avoided. Some are also available with ecolabel certificates such as Nora® Healthcare Flooring. Rubber flooring offers low maintenance costs, slip resistance, good acoustics and underfoot comfort. In addition rubber requires no stripping or waxing or the use of aggressive chemicals for cleaning and is largely stain resistant and has very low emission levels.

However, while these alternatives to PVC flooring may be safer during manufacture and use and as waste, there is still the problem that none are specifically designed with recycling in mind and with the logistics for post consumer recovery in place. Added to concerns over the recycling potential of

flooring, is the intrinsic high level of waste associated with most installations. This can mean around 30% of newly manufactured material going straight into the waste stream. While organisations such as Carpet Recycling UK and the Flooring Sustainability Partnership are working hard to improve the situation, significant progress is only possible where there is a serious rethink about some of the fundamentals.

From a manufacturing viewpoint a strong lead has been given by those manufacturers who have adopted so called “Cradle to Cradle®” design principles. This usually involves significant re-engineering of products and a move to materials which can not only be recycled into other products but eventually 100% upcycled, post consumer use, to replace virgin raw materials for new flooring in a continuous virtual circle. In addition they are required to meet stringent chemicals safety standards. Shaw has led the way with this initiative and now reclaims around 100 million pounds of nylon polymer from post consumer carpet each year. It also uses a backing material which is being similarly recovered and incorporated into virgin backing for new tiles. Others manufacturers such as Forbo, Desso and Tarkett are introducing “Cradle to Cradle®” certified flooring products.

Manufacturers are now actively entering into programmes which recover post consumer nylon from used carpet products through shaving this from the backings and sending it on for reprocessing by fibre manufacturers. In the case of nylon 6 pile this is increasingly being sent to the Aquafil’s depolymerisation facility in Europe where it is processed to become new carpet fibre. While this is a welcome development and has led to the appearance of 100% recycled carpet piles, there is still the problem of what to do with the difficult – if not impossible – to recycle the backings from which this material originated and which is still largely condemned to the waste stream. As backing represents over 80% of the weight of the recovered material, recycling of pile fibre is clearly only a partial answer.

It would appear to me that major strides could be made in all of the relevant issue of design for the environment if government funds were made available to support the following:

- The introduction of financial incentives for smaller manufacturers to commit to Cradle to Cradle design and to invest in new raw materials particularly for recoverable backings from carpets In order to dramatically and permanently reduce the flow of flooring to waste streams and to increase the competitiveness of UK based companies.
- Establishing a forum involving manufacturers, architects and specifiers together with the largely untapped resource of flooring contractors to target significant reductions in waste from flooring installations.

In the next article I will look at emerging Environmental Certification and Environmental Product Declarations (EPD’S)

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