GUIDANCE DOCUMENT FOR DEVIATION MANAGEMENT CONCERNING PRODUCT CHOICE FOR FLOOR AND WALL COVERINGS MADE OF PVC CONTAINING DINP/DIDP 2016-05-30

Background

Within the Swedish building sector, there are several voluntary assessment systems which aim to phase out hazardous substances from building and construction products. These include BASTA, Byggvarubedömningen and Sunda Hus. There are, however, still occasions when products not approved in these systems need to be used. In addition, there is a growing interest in using recycled materials which may contain substances not approved by the assessment systems. There is thus a need for knowledge and support regarding how to motivate and manage deviations from requirements set up by the voluntary systems in connection to product choices that involve building products which do not meet the requirements but which are considered to be irreplaceable.

This guidance document aims to provide support in connection to product choices regarding floor and wall coverings made of PVC that contains the plasticizers diisononylphthalate (DINP) and/or diisodecylphthatalate (DIDP). DINP and DIDP do not meet the property requirements in BASTA and Byggvarubedömningen due to suspicions on endocrine disruptive properties. This implies that products which contain more than 0.1 % of these substances will not be approved by the systems. This guidance document does not influence the criteria used in the assessment systems, but should be used as a support for managing deviations from the requirements. There are approved alternative plasticizers to DINP and DIDP during new production of floors from virgin materials, but when recycled materials are used, it is often difficult or impossible to avoid these substances, since there are currently not enough DINP/DIDP-free materials available.

This guidance document is based on a literature study that was financed by the Swedish Floor Industry and the IVL foundation (SIVL) (IVL report B2260). Based on the conclusions drawn in that study it is the opinion of the project group that a deviation from the environmental assessment systems concerning floor and wall coverings made of PVC containing DINP and DIDP can be motivated under the following circumstances:

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A deviation from the chemical requirements of the assessment systems in terms of PVC floor and wall coverings containing DINP and / or DIDP may be justified provided that:

- The content of DINP and DIDP derives from the use of recycled materials blended into new production. The contents of all constituent phthalates should be known and documented. It is judged to be of particular importance when using recycled materials, which, in addition to DINP / DIDP also may contain impurities of hazardous phthalates which may result in a non-acceptable deviation from the assessment system requirements, such as DEHP.

PVC floor and wall coverings containing DINP and / or DIDP and which fulfil the condition above can be registered in the BASTA system registry "Risk evaluated articles". For products registered in this part of the BASTA system the concentration of DINP and DIDP in the material should be stated.

These recommendations should be reviewed within two years, as there is ongoing work within the EU relating to legislation on potential restrictions and classification of endocrine disruptors and it is not yet clear whether DINP and DIDP will be covered by such a classification.

Environmental and health risks

The literature study found no evidence for any health risks during normal use or residence in rooms with floor and wall coverings made of PVC treated with DINP/DIDP. Health effects of these plasticizers have been observed, but at levels far higher than the level of exposure that arise in the indoor environment as a result of DINP and/or DIDP in PVC flooring and wall coverings. The level of exposure arising from emissions of DINP from floors has been estimated to be about 2,500 times lower than the levels of tolerable daily intake suggested by the European Food Safety Authority, EFSA, and more than 10,000 times lower than the lowest recorded level where no effect could be detected (NOEL). Regarding the environment, these substances occur in the environment as a result of extensive use of a large amount of goods. However, under most conditions they have been shown to undergo relatively rapid degradation, i.e. the substances are broken down into other substances and do not accumulate in the water, air and soil.

The identified risks associated with high exposure to DINP and DIDP are related to liver toxicity. These risks have been managed through the REACH legislation, which regulates the use of high molecular weight phthalates, such as DINP and DIDP in children toys. In addition to liver toxicity, there are also studies indicating endocrine disruption, and suspicions that exposure during fetal development may be particularly critical for these effects. However, the effects observed have been detected at levels well above the level that people, including infants, are considered to be exposed to in the indoor environment.

Scientists so far disagree on how endocrine disruptors should be risk assessed. Some researchers support the notion that it is difficult or impossible to determine a clear threshold level, below which the substance has no adverse effect, and thus mean that the substances should not be allowed. Other scientists are of the opinion that it is possible to determine the threshold dose even for endocrine disruptors. Work is currently underway within the EU to develop criteria for the classification of endocrine disrupters (EDCs), and it is currently unclear whether the substances DINP and DIDP will fall within those criteria or not.

Until the criteria for EDCs have been finally set and it has been made clear whether DINP and DIDP meet these criteria, the project team is of the opinion that it is justified to avoid the use of DINP/DIDP the virgin material, but that recycling of DINP / DIDP-containing products is justifiable. This avoids new supply of the substances while the exposure levels due to discharge of DINP / DIDP from recycled products is assessed to be low.

De risker som förknippas med hög exponering för DINP och DIDP är med avseende på levertoxicitet. Dessa risker har hanterats genom EU:s gemensamma kemikalielagstiftning REACH, och innebär att användning av högmolekylära ftalater såsom DINP och DIDP i barnleksaker är reglerat. Förutom levertoxicitet, finns även studier som indikerar hormonstörande effekter, och misstankar om att exponering under fosterstadiet kan vara särskilt kritiskt för dessa effekter. Generellt gäller dock att de effekter som observerats har påvisats vid halter som ligger långt över den nivå som människor bedöms utsättas för i innemiljön.

Inom forskningen råder än så länge delade meningar om hur hormonstörande ämnen bör riskvärderas. En del forskare stödjer uppfattningen att det är svårt eller omöjligt att bestämma en tydlig gräns, så kallad tröskeldos, varunder ämnet inte har någon negativ effekt, och menar därmed att ämnena inte bör tillåtas. Andra forskare anser att det går att fastställa tröskeldos även

för hormonstörande ämnen. Arbete pågår för närvarande inom EU med att ta fram kriterier för klassificering av hormonstörande ämnen och det är i nuläget oklart huruvida ämnen som DINP/DIDP kommer att falla inom ramen för sådana kriterier eller ej.

Fram tills att detta har klargjorts anser projektgruppen att det är motiverat att undvika användning av DINP/DIDP vid nyproducerat material, men att materialåtervinning av DINP/DIDP-innehållande varor är försvarbart. På så vis undviks nytillförsel av ämnena samtidigt som exponeringsnivåerna till följd av utsläpp av DINP/DIDP från återvunna produkter bedöms som låga.

The potential risks associated with the content of DINP and DIDP in floor and wall materials of PVC should be related to the environmental benefits that recycling brings in the form of smaller climate impact. The option not to approve DINP and DIDP basically means that it is not possible to use recycled material, since there is still insufficient quantities of recycled material free of DINP and DIDP available. When recycled raw material is blended into production of new floors and walls, it means that the concentration of DINP and DIDP are even lower than if DINP and DIDP are used as primary plasticizer.

Recycling

DINP and DIDP are added to PVC floor and wall coverings for their plasticizing properties. There are effective and approved alternatives to DINP and DIDP which are used by many manufacturers in the production of new floor and wall coverings today. However, in their strive towards closing loops, reducing climate effects and working towards a circular economy, there is a desire to continue to and possibly increase the use of recycled materials as a component in new production. The recycled material may consist of both production and installation waste as well as older, previously used materials which may contain both DINP and DIDP as well as other phthalates.

The production of PVC floor and wall coverings from pure virgin resources requires more energy and access to raw materials than if recycled materials are used. It is therefore more resource efficient and less damaging to the climate to use recycled materials. However, it is important to keep control over the substances present in the recycled material to avoid negative effects as a result of unintended exposure. If the material contains substances which were formerly used in production but which have been phased out because of properties damaging to health and environment, there may be reasons to limit recycling, or to find forms of use where the discharge of and exposure to hazardous substances is considered small.

Examples of applications with low risk of release of DINP / DIDP

Typical applications for PVC floor and wall coverings with the content of DINP and DIDP, where the release of substances judged to be low, is when the recycled fraction is placed on the underside of the material, i.e. when the floor has a surface layer of virgin material. Another use type could be when PVC floor and wall coverings are placed as waterproofing under tiles.These forms of use causes no abrasion of material in the surface layer, while there are overlying layers that form a barrier to direct diffusion of the substances DINP and DIDP. These types of applications are considered suitable examples of the use of recycled PVC, where the release is judged to be especially low.

Phase-out of DINP / DIDP

A phase-out of DINP and DIDP in floor and wall coverings made of PVC has already largely taken place in Sweden and Europe on a voluntary basis, and they have replaced by other plasticizers. However, DINP and DIDP are still primary plasticizers in products imported from other markets, and may occur in recycled products, which are advantageous to blend in as recycled raw material in new production from a resource and energy point of view. With time the content should however be dispersed and gradually decrease also in these types of recycled materials.

The project team that has developed this guidance consists of:

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The following organizations have participated in the project's reference group: Altro Nordic, Amtico International, Atkins Global, BASTAonline; Byggvarubedömningen, Idea Trading AB, IKEM, JM, Peab, City of Stockholm, Tarkett, the Swedish Construction Federation and the Swedish Environmental Research Institute