

Environmental Research Plan
of the Federal Ministry for the Environment,
Nature Conservation and Nuclear Safety

Environmental Product Management

Reference Number (UFOPLAN) 202 95 384

**Safe Construction Products for Health and the Environment:
How much testing is necessary to implement
the EC Construction Products Directive?**

ABSTRACT

by

Ulrike Rheinberger
Dr. Dirk Bunke

Öko-Institut e.V.

Commissioned by the Umweltbundesamt (Federal Environmental Agency)

March 2006

In the first generation of harmonised standards and approval guidelines in accordance with the framework of the construction products directive, no requirements were included for the fulfilment of *Essential requirement no. 3 Hygiene, Health and Environment*. These requirements shall be included in the revision of the standards, i.e., in the second generation. For this purpose, the European Commission has provided Mandate M/366 *Horizontal Complement to Mandates CEN/CENELEC, Concerning the Execution of Standardisation Work for the Development of Horizontal Standardised Assessment Methods for Harmonised Approaches Relating to Dangerous Substances Under the Construction Products Directive (CPD)*.

To minimise the burden of testing and to avoid that construction products, which have already been demonstrated to be safe for health and the environment, have to be repeatedly tested, the mandate includes the option of exempting groups of construction products by classifying them as WT (Without Testing) or WFT (Without Further Testing). Formally, WT and WFT are distinguished by the fact that WT classification is based on existing knowledge while WFT classification is based on a characterisation test through harmonised European test methods. The development of testing methods shall begin in 2006. It will take at least 5 years before the first European test methods can be expected.

This report shall contribute to efforts of the European Commission and the European Committee for Standardization to implement the WT-/WFT-Concept. In this project, a national point of view was taken, which means that the question was asked how the WT/WFT concept should be designed to satisfy the existing and targeted level of protection to the environment and health in Germany. The inquiry was carried out on the basis of two exemplary product groups: „plasters, mortars and gypsum boards“ and „road construction products“. In what follows the general results of the project are outlined, before addressing product specific conclusions.

In this project, the question was asked which fundamental characteristics a product group would need to have to be classified as WT or WFT. Different opinions were expressed by the stakeholders involved. On the one hand, the opinion was held that only products which contain no dangerous substances at all or which contain largely inert materials, as, for example, glass panes could be classified as WT. On the other

hand, the opinion was held that product groups could be classified as WT, also when they contain dangerous substances, but do not emit them (or do so in a negligible way). In the latter case, the complexity of the chemical composition is not the critical factor, but the completeness and reliability of existing knowledge of the products.

In conclusion, we argue for the possibility of defining the WT classification in a wider rather than more restricted sense. For two reasons: firstly, it is the objective of WT or WFT classification to minimise testing burden where it is not essential for the protection of health and the environment. WFT classification is more onerous with regard to administrative and technical realisation than the WT one, due to the necessary characterisation test based on harmonised test methods. As far as the objective – i.e., the identification of construction product groups that are safe for health and the environment – can be achieved with the less onerous procedure, this should be made possible. Secondly, it should be avoided that construction product groups which have already been extensively investigated are tested again only for formal reasons, if the results are already predictable. In the end, this would also reward those manufacturers who have already invested in testing and optimizing their products with regard to health and environment related performance.

The next decisive question was, which benchmark and which procedure would be appropriate to achieve the WT or WFT classification. The WFT classification will be possible only once the corresponding European test methods are available. For this reason, the focus of the project was put on the question if and how a WT classification could be managed.

Construction products have to be safe for health and the environment – no matter whether they are classified as WT or WFT or if they have to be continuously tested. The reference points are the National and European Legal Provisions. Environmental and health related target values (immission values) are set either on European or on national levels. However, the transfer to corresponding product related test and limit values (emission values) is partially still under development. Product related tests and the definition of product related test values are also always a convention-based compromise between precise reproduction of actually occurring contributions to immissions and feasibility and testing efforts.

In Germany, for indoor air quality as well as for effects on soil and water, assessment methods are available, which prescribe which emission-related criteria construction products have to fulfil to be in accordance with immission related provisions and tar-

get values. The scheme of the *Committee for Health Assessment of Construction Products* (German designation: *Ausschuss zur gesundheitlichen Bewertung von Bauprodukten – AgBB*) describes the *Procedure for the Health Assessment of Emissions of Volatile Organic Compounds (VOC und SVOC) from Construction Products*. The principles of the *German Institute for Structural Engineering* (German designation: *DIBt - Deutsches Institut für Bautechnik - DIBt*) describe the *Assessment of Effects of Construction Products on Soil and Groundwater* “.

With these, at least from a national standpoint, benchmarks are available for the assessment of “safe for health and the environment” for WT and WFT as well as for FT classification. They represent the starting point and the criteria for the development of horizontal European testing methods, but they offer already today an orientation for WT classification. This does not mean that construction product groups have to be tested in all cases according to the test methods mentioned in the assessment methods, but rather that the criteria mentioned there represent the benchmark for such classification. For some product groups testing might not be necessary, when it is clear from a scientifically based documentation that the products fulfil the criteria of the assessment methods. For other product groups, test results corresponding to the criteria mentioned in the assessment methods might be necessary to ascertain safety for health and the environment beyond any doubt.

From a national point of view product groups, which fulfil the above-mentioned assessment methods, can be assessed as WT, as long as other existing specific provisions are eventually fulfilled, as for example those for formaldehyde. The prerequisite being that the product group is homogenous and stable with regard to release characteristics and that fulfilment of the criteria, with respect to compliance with target values, has been clearly proved. However, it has to be clarified if other Member States have additional or stricter requirements, as WT or WFT classification requires that a product group fulfils all the requirements applied in the Member States. This was not assessed in the current project.

Harmonised European standards and approval guidelines are and should be formulated “performance oriented”. For the definition of mechanical characteristics, this can be usually achieved without defining the product’s material composition. With regard to health and environmental characteristics, the performance (i.e., the release of dangerous substances) depends on the chemical composition, (i.e., the substances contained and their chemical bond). For products continuously tested for their emis-

sion performance, a substance-based product definition is not essential. However, for WT classification it is obligatory to define product groups so clearly that all product variants on the market are covered. This may be unproblematic for some product groups, as, for example, glass panes. For other product groups, in particular for formulation-based products, it would be target-oriented to include substance-related product definitions or certain descriptive attributes in the standards.

For WT classification - to put it simply - three conditions have to be fulfilled. There is a generally acknowledged assessment method, which can be used as a benchmark for the assessment of health and environmental safety. It is possible to formulate a product definition that clearly describes products with regard to their health and environmental performance. Applicants are able to present generally acknowledged and scientifically based documentation and/or research or testing results for their product group.

In comparison to other essential requirements, which have to be fulfilled within the construction products directive, there is less experience for the assessment of health and environmental-related product performance. Therefore for WT classification an expert group, which will assess requests for WT classification, will have a key role. While it is conceivable that in the future self-classifications may also become an option, in the beginning it is indispensable that questions and doubts that arise will be evaluated by a body that has an accordingly broad competence and authority.

In the project, exemplary product groups provide concrete examples of problems that arise when classifying a product group as WT and how they might be solved. For indoor air related questions, the groups of plastering, mortars and gypsum boards have been chosen. These product groups were assumed, on the one hand, to be safe with regard to indoor air, while, on the other hand, they presented a challenge, because of the great number of formulations to be assessed. With regard to soil and groundwater, road construction products were chosen, because the product groups were assumed safe and because the body of regulation for road construction has a longer tradition of integrating environmental requirements.

For plasters, mortars and gypsum boards the project confirmed this assumption and the workshops carried out with representatives of public authorities and industry confirmed that these product groups are generally safe for indoor air emissions and that they are suitable for WT classification. One can expect that no significant indoor air emissions occur with the substances usually used for the composition of these prod-

ucts. However, it also became evident that for the formulation of a scientifically validated documentation, some basic research on emission performance is necessary to prove safety. In addition, solutions have to be found to provide unambiguous product definitions. The *Industry Association of Factory-Made Mortars (Industrieverband Werkmörtel)* has commissioned in the meantime a research project on the products produced by its members, where tests on the emission and release performance of different product types will be carried out to provide the scientific basis for the request of WT classification.

In the road construction products group, asphalt, concrete and aggregates were considered. As a result, it was found out that asphalt and concrete products for road construction may be classified as WT with a relatively simple documentation. As they are applied as water impermeable constructions, no seepage water can contribute to hazards for soil and groundwater. While being product groups with partially complex compositions also containing dangerous substances, (for example, additives), the intended use ensures safety for health and the environment. A further condition for the classification of asphalt and concrete in road construction is that requirements concerning secondary construction materials applied in Germany are also considered.

The result for natural aggregates was a surprise, as at the beginning of the project it was assumed that this product group could also be classified as WT with a simple scientifically based documentation. As long as the intended use is to apply them in impermeable construction methods, the WT classification can result from the same documentation as for asphalt and concrete. If the intended use is for water permeable construction methods, one must ask if dangerous substances could be released, which reach soil and groundwater through the seepage water. This question does not arise, when natural aggregates are used in the geological regions where they have been extracted. Here no deterioration of geogenic background concentrations is to be expected. When using them in other geologic regions in water permeable construction methods, it cannot be excluded that aggregates with higher contents of trace-elements release substances in concentrations above precautionary values defined within the framework of soil protection and water management regulations.

For natural aggregates applies analogically to plasters, mortars and gypsum boards: for the formulation of a request for WT classification, a reliable standard of knowledge has to be proved. For this, results from orienting leaching tests for aggregates with high contents of trace elements could be sufficient. As natural aggregates be-

come better described in the context of extraction applications, such orienting test results could well be transferred to the entirety of aggregates. Another option would be to approve WT classification with the proviso that it is only valid for water permeable construction methods, if the construction is carried out in the geological region of the extraction site (or in an equivalent or less sensitive region).