Legal Basics.

Private Test Labels in Context of Construction Products Legislation.

1. THE EUROPEAN CONSTRUCTION PRODUCT REGULATION (CPR)

The formerly implemented Construction Products Directive [1] was replaced by the Construction Products Regulation (CPR) [2]. The latter represents for all member states within the European Union directly applicable law. In contrast to other European Community related harmonization legislations [3-6], CPR [2] does not immediately focus on compliance with single construction products' essential characteristics but refers to basic requirements targeted for buildings made up of construction products. These basic construction works related requirements are listed in CPR [2] appendix I, and comprise features like mechanical and structural stability, fire protection/ fire resistance, hygiene, health, environmental protection, sound insulation, energy conservation and thermal insulation.

Consequently, construction products must be appropriately designed that construction work made up of them may fulfill the defined basic building characteristics.

2. TERM DEFINITION OF A CONSTRUCTION PRODUCT

The term definition of a construction product is given in Article 2, Paragraph 1 of CPR [2]. A construction product represents any product or assembly kit manufactured and marketed to be installed permanently in construction works or parts thereof whereby the construction product´s performance must have an impact on the performance of the building itself with regard to the defined basic requirements according to CPR appendix I.

This definition implies that the construction product must be placed on the market. The marketing act is bound to the status change in ownership [7] based on a transaction with or without any financial compensation. Moreover, the product must be installed permanently in the construction work respecting the intended use and market specific application scope, neglecting in parallel the user´s specific application mode. The construction product must have an impact on the performance of the building. Articles exclusively bearing a visual effect on the construction works´ appearance do not scope with the definition term.

3. EUROPEAN HARMONIZED STANDARDS (HEN) OR TECHNICAL SPECIFICATIONS

If a construction product is covered by the scope of a harmonized European standard (hEN) or a technical specification the manufacturer must provide a declaration of performance (DoP) in accordance with CPR [2] Article 4, Paragraph 1. The concerned construction product has to be labeled mandatorily with the CE mark under the condition that the construction product is compliant with at least one normative single performance feature declared in a defined AVCP-system class (AVCP = Assessment and Verification of Construction Products, refer to item 7). Construction products covered by the scope of a European harmonized standard (European harmonized Norm, hEN) or a technical specification are classified as regulated construction products.

4. THE CE-MARKING

The CE-marking does not imply compliance of a construction product with performance features defined in a harmonized technical specification but represents both conformity of a concerned construction product with a declared performance in the declaration of performance document (DoP) and compliance with CPR provisions or further European harmonization rules [3-6].

5. THE EUROPEAN TECHNICAL ASSESSMENT (ETA) [7]

If no European harmonized standard or technical specification is available, the performance of a construction product can be verified with regard to specified essential characteristics via a European Technical Assessment (ETA) issuing a European Assessment Document (EAD) by a notified technical assessment body. In Germany the „German Institute for Technical Engineering" (Deutsches Institut für Bautechnik, DIBt) [8] is authorized for technical assessment activities. An issued ETA serves alternatively as basis for the CE-marking of a construction product. Both testing extent and the definition of essential characteristics to be examined for a non-regulated construction product are defined by the European Organization for Technical Assessment (EOTA). In case of an approved European Technical Assessment a declaration of performance (DoP) has to be provided in accordance with CPR [2] Article 4,

Paragraph 1. An ETA can also be applied for, if the applicable European harmonized standard (hEN) does not describe an appropriate assessment procedure for at least one essential characteristic of the construction product.

6. DECLARATION OF PERFORMANCE (DOP)

When providing a declaration of performance (DoP) at least one performance feature [9] of the essential characteristics listed within the correlating European harmonized standard or technical specification has to be respected. Under the condition that delegated legal acts demand mandatorily the declaration of a specific performance characteristic, this requirement has additionally to be fulfilled. Moreover, specific essential characteristics have to be declared for which targeted application requirements come into force at place of usage or application. Exemptions for providing a declaration of performance are regulated in CPR [2] Article 5. Non-assessed essential characteristics listed in a European harmonized standard have to be marked with the hint "NPD" (No Product Declaration).

7. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (AVCP)

The procedure for assessment and verification of constancy of performance may assure that articles from ongoing production are in compliance with performance characteristics stated in the declaration of performance (DoP). According to CPR [2] appendix V, five AVCP-system classes (1+, 1, 2+, 3 and 4) are defined representing different requirement schemes for manufacturers and notified bodies involved, respectively. The performance characteristics listed within a European harmonized standard (hEN) correlate to defined system classes.

The manufacturer declares at least one selected performance parameter in an assigned system class. However, the manufacturer can voluntarily decide to use a higher AVCP-class for the assessment and verification approach. The most restrictive requirements are attributed to the system class 1+.

Table 1 summarizes partial aspects and task profiles assigned to different system classes. For instance, in system class 4 no notified test body must be involved in the assessment and verification procedure. Notified test and / or certification bodies designated within the AVCP approach are listed on the website [10] of the European Commission.

TABLE 1

SYSTEMS FOR ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE		SYSTEMS				
		1+	1	2+	3	4
Manufacturer	Assessment of product type	—	—	yes	—	yes
	Testing of sample taken in the manufacturing plant according to defined test plan	yes	yes	yes	—	—
	In-house production control	yes	yes	yes	yes	yes
Notified Body Assessment of product type	Assessment of product type	yes	yes	—	yes	—
	Audit testing of sample(s) taken at the manufacturing plant or storage facility before marketing of the product	yes	—	—	—	—
	Initial inspection of the manufacturing plant and of factory production control	yes	yes	yes	—	—
	Continuing surveillance, assessment and evaluation of factory production control	yes	yes	yes	—	—

8. EU-MEMBER STATE SPECIFIC REQUIREMENTS FOR CONSTRUCTION PRODUCTS

If a construction product is not covered by the scope of a European harmonized standard or technical specification and is consequently not labeled with the CE-mark according to CPR [2] legislation provisions, the manufacturer must verify whether on member state specific level technical requirements regarding both the constancy of performance and application of a construction product are legally implemented, and have to be additionally respected.

8.1. TECHNICAL ENGINEERING REQUIREMENTS FOR CONSTRUCTION PRODUCTS IN GERMANY

Technical engineering codes for construction products not labeled with a CE-mark are summarized in the document „Pattern Administrative Regulations of Technical Rules for Construction Products" (Musterverwaltungsvorschrift Technische Baubestimmungen für Bauprodukte, MVV TB) [11]. The MVV TB specific requirements for construction products will be implemented without any changes in the building codes by Federal States according to the applicable state building laws, will be substantiated or more detailed particularized. The federal state specific requirements come into force in place of application and usage of the concerned construction product. MVV TB part A concretizes the technical rules applicable for basic requirements concerning construction works.

In analogy to CPR [2] annex I, MVV TB part A defines requirements for construction works with regard to mechanical and structural stability, fire prevention, ambient air hygiene, health issues, environmental protection, safety and usage accessability, sound and thermal insulation.

8.1.1. THE DECLARATION OF COMPLIANCE (Ü-MARK)

The manufacturer of a construction product concerned by MVV TB requirements must confirm conformity with defined technical rules providing a declaration of compliance and mark the product transparently with a label of conformity (Ü-Mark, surveillance mark). In the scope of the surveillance mark (Ü-Mark) different procedures come into force: the ÜZ-, ÜHP- and ÜH-approach. For instance, the ÜZ-concept comprises a factory-on-site inspection, a randomized test specimen sampling, an initial testing of the applicable construction product and a periodically recurrent surveillance control testing for defined performance characteristics. All obligations are delegated to a certification body notified in accordance with federal construction products state building laws. The ÜHP-approach waives the surveillance activities, the ÜH-process is exclusively based on manufacturer actions and self-declarations.

8.1.2. THE GENERAL TECHNICAL APPROVAL (IN GERMANY: ABZ)

Construction products for which no technical rules – in terms of usable and available technical standards and specifications – or technical construction regulations exist, have already been implemented or which differ distinctly from commonly available technical specifications are classified as non-regulated construction products. The verification due to application usability of non-regulated construction products on national level can be made on basis of a general technical test certificate (in Germany: abP), an approval in individual evaluation case (in Germany: ZiE) and in the scope of a general technical approval (in Germany: abZ). The awarded approval targeted on the product´s application usability is demonstrated in compliance with the Ü-mark labeling respectively. The competent authority for all activities related to the Ü-mark approval process is the "German Institute for Technical Engineering" (DIBt). The legal foundation for conferring a general technical approval (abZ) forms the "Model Building Code" [12].

8.1.3. REQUIREMENTS FOR CONSTRUCTION WORKS WITH REGARD TO HEALTH PROTECTION ISSUES

Appendix 8 of MVV TB [11] concretizes the requirements for construction works and buildings with special focus on health related issues. Thereby, health and hygiene specific needs are derived from health related impacts or properties of used or installed components, construction kits and building materials. Especially, potential emissions of volatile organic compounds [13-16], the release of inorganic substances (i.e., ammonia, sulphur dioxide, nitrogen oxides etc.) and additionally respirable particles caused by construction products with direct or indirect contact to interiors are of relevant interest.

Moreover, chemical substance related restrictions according to European chemical legislation [17-19] have to be considered and respected whereby the constitutional application of carcinogenic or mutagenic classified compounds of categories 1A and 1B is prohibited or directly bound to a complete risk exclusion approach.

Additionally, requirements for construction products with correlation to an inherent contamination load with harmful substances have to be respected legally implemented on national level, and valid at place of marketing or installation [20,21].

Furthermore, special protection requirements for recreation and structurally not separated interior rooms have to be observed. The conscious usage of substances classified [22] as acutely toxic (Acut. Tox.) of categories 1, 2 and 3, of compounds toxicologically graded as toxic to reproduction of categories 1A and 1B or specific target organ-toxic qualified chemicals categorized as STOT 1 (single, repeated exposure) is exclusively permitted, if any health related exposure effect can be excluded for the interior building room occupants. The emission evaluation of construction products is based on test chamber [23] examinations according to requirements defined in the harmonized standard EN 16516 [24].

8.2. FEDERAL EU-MEMBER STATE RELATED REQUIREMENTS FOR CONSTRUCTION PRODUCTS

CPR [2] was implemented with the intention to form a harmonized legislation framework ensuring a consistent protection level for construction products within the European market simultaneously avoiding and eliminating trading barriers. Nevertheless, in certain EU-member states even for regulated construction products – products for which a European harmonized standard or technical specification is available – additional requirements concerning selective performance features come into legal force which have to be respected mandatorily by manufacturers, importers or trading agents when the product is marketed in the specific country.

8.2.1. FEDERAL STATE SPECIFIC REQUIREMENTS FOR CONSTRUCTION PRODUCTS IN FRANCE

Within the scope of the French „Grenelle" legislation framework [25-27] specifications with regard to indoor air hygienic evaluation of construction products and associated decorative objects for interiors are legally established. On basis of test chamber results the evaluated products must be assigned to a defined emission class and labelled accordingly. The French regulation scope covers both on EU level regulated and non-regulated construction products. The manufacturer, importer or distributing company placing concerned products on the French market is responsible for the correct labeling of the product. Moreover, the release of selective CMR [22] substances is bound to defined concentration limits.

8.2.2. FEDERAL STATE SPECIFIC REQUIREMENTS FOR CONSTRUCTION PRODUCTS IN BELGIUM

Referring to the basic requirements "hygiene, health and environmental protection" specified in appendix I of CPR [2] for construction works, a royal decree [28] defines threshold limit values for indoor air emissions covering construction products listed in decree attachment 1. Consequently, for economic actors it is prohibited to place construction products on the Belgian market which do not comply with defined threshold limit values specified in attachment 2 of the royal decree. The construction products´ evaluation is based on a test chamber examination [23].

8.2.3. FEDERAL STATE SPECIFIC REQUIREMENTS FOR CONSTRUCTION PRODUCTS IN LITHUANIA

In chapter V of the correlating regulation draft [29] requirements concerning health protection issues for polymeric building materials and polymer-based furniture materials are enumerated.

The evidence on conformity is provided via test chamber related VOC concentration findings quantified in accordance with normative requirements based on EN ISO 16000-6 [30]. Additionally, pursuant to item 13 products in the scope of the regulation draft must be manufactured in full compliance with the provisions of the actually valid chemical regulations framework and laws [17], and have to be evaluated with regard to their performance features respecting technical specifications, standards, disclosed formulations of articles or technical regulations declared and quoted by manufacturer.

9. PROVISION GAPS CONCERNING PERFORMANCE FEATURES RELATED TO BASIC REQUIREMENTS FOR CONSTRUCTION WORKS

Particularly, for EC non-regulated construction products and products not covered via technical regulations on national level both an information gap due to compliance and verification management strategy concerning product performances exists with regard to the basic requirements for construction works (refer to item 1). Besides the non-availability of technical specifications for a variety of construction products, accessible European harmonized standards frequently reveal provision gaps with regard to defined performance criteria related to basic requirements applicable for construction works or show deficiencies with respect to test methods enabling the evaluation of the construction product´s performance efficiency and constancy.

These requirement gaps basically refer to performance features like hygiene, health and environmental protection related issues. The feature group "hygiene" includes requirements with reference to the release of toxicologically relevant or dangerous substances comprising adversely acting carcinogens like Formaldehyde (CAS-No. 50-00-0) [31] and Acetaldehyde (CAS-No. 75-07-0) (annex VI [22]), volatile organic compounds (VOC, refer to item 8.1.3 [13-16]) and optionally material specific chemical contaminations. In analogy to the determination of VOC concentrations, the quantification of Formaldehyde [32] and Acetaldehyde [33] release is based on performing test chamber [23,24] examinations. If a product-specific European harmonized standard does not refer to the performance criterion "hygiene" in detail, the construction product covered by the normative scope must not be evaluated, assessed and verified due to this performance feature and need not to be considered in the declaration of performance (DoP).

Since CPR [2] inter alia links the safety of construction works to means of health protection, already established and accessible European harmonized standards must be updated and supplemented step by step with currently missing safety feature issues. For that reason, Commission Services responsible for CPR [2] confer mandates to product related sector groups. Consequently, continuous control and check activities by the manufacturer of a construction product are necessary to assure that newly added or additionally specified performance features for a construction product are considered or respected in the ongoing assessment and verification process (AVCP) for constancy of performance. Optionally and where indicated, a notified test or certification body has to be involved in the assessment and verification activities.

10. MEANING AND USAGE OF PRIVATE LABEL BASED ASSESSMENT SPECIFICATIONS AND TEST CERTIFICATES FOR CLOSURE OF PERFORMANCE FEATURE RELATED REQUIREMENT GAPS

If no norms or technical specifications for construction products specifying performance features are established or available to general public, the arising assessment and evaluation gap can be closed on federal state level in Germany in the scope of applying for a "General Technical Approval" (in Germany: abZ) issued by the "German Institute for Technical Engineering" (DIBt). Alternatively, a voluntary test – however without any legal relevance – can be used for verifying a construction product´s performance characteristic.

In the sense of a hygienic assessment of construction products with respect to the release of volatile and toxicologically relevant compounds (carcinogenic, mutagenic, reprotoxic, acutely toxic, specific target-organ toxic, sensitizing substances, endocrine disruptors) into ambient air, a variety of different test and evaluation schemes [34-41] are available and established. The latter ones can be used for proving risk mitigation in relation to an inhalative exposure of indoor occupants towards volatile toxicologically relevant noxae. In case of compliance, the evaluation schemes often enbable in parallel the award of private law based test labels.

11. COMBINATION OF DIVERSE TEST AND EVALUATION SCHEMES FOR THE EMISSION ASSESSMENT OF CONSTRUCTION PRODUCTS IN RELATION TO INDOOR AIR QUALITY ISSUES

Simultaneously, with implementation of the horizontal applicable European harmonized rule EN 16516 [24] a standardization in performing test chamber examinations for construction products occurred. Published test and evaluation schemes [34,36-41] focusing on indoor air quality issues also refer to these standard related requirements. Consequently, a single test chamber examination on basis of this EN standard facilitates the evaluation of analytical test findings according to different assessment schemes.

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