

Product Requirements.

Guideline Information: Formaldehyde Release from Wood-Based Panels.

SCOPE OF RELEVANCE?

A. Wood-based panels for use in construction (EN 13986)¹

Scope of application: Wood-based panels, rough, laminated, veneered, lacquered for

- interior usage as load-bearing components in dry environment,
- protected interior and protected exterior usage as load-bearing components in moist area,
- usage as load-bearing components in exterior area,
- interior usage as non-load-bearing components in dry environment,
- interior and protected exterior usage as non-load-bearing components in moist area,
- usage as non-load-bearing components in exterior area,
- usage as load-bearing flooring on sleepers in dry, moist and exterior areas,
- usage as roof boarding on bars in dry, moist or exterior areas,
- usage as load-bearing wall panelling on ridges in dry, moist or exterior areas.

Types of composite wood-based panels in the scope of the European harmonized standard (inter alia):

- solid wood board (EN 13353),
- laminated veneer lumber (LVL, prEN 14279),
- plywood (EN 636),
- oriented strand board (OSB, EN 300),
- synthetic resin bonded particleboard (EN 309, EN 312),
- cement-bonded particleboard (EN 634-2),
- fiberboard – rigid board (EN 316), medium density fiberboard (EN 316, EN 622), cellular board (EN 316), MDF (prEN 622), UL-MDF (ultra-light, prEN 622), L-MDF (light, prEN 622-5).

B. Wood-based panels for application in furniture²

Scope of application: laminated and non-laminated composite wood-based panels (chipboards, block-board panels, veneer panels, fiberboards).

WHICH LEGAL DEMANDS ARE IN FORCE?

Manufacturer / Distributor

A. European Union Level

EN 13986¹, annex B, obligation for classification of the composite wood-based panel with regard to the release of Formaldehyde in accordance with the categories E1 ($\leq 124 \mu\text{g}/\text{m}^3$) und E2 ($> 124 \mu\text{g}/\text{m}^3$)

- Reference method for initial testing: EN 717-1³ (test conditions: air exchange rate $n_{\text{TC}} = 1.0 \text{ h}^{-1}$, area-specific air exchange rate $q_{\text{fl}} = 1 \text{ m}^3/\text{m}^2\text{h}$, loading factor $L_{\text{TC}} = 1.0 \text{ m}^2/\text{m}^3$, temperature of inlet air $T_{\text{TC}} = 23 \pm 0.5 \text{ }^\circ\text{C}$, relative humidity $r.H_{\text{TC}} = 45 \pm 3 \%$, partially covering of open edges: quotient of extent (sample size) to surface area = $1.5 \text{ m}/\text{m}^2$).

B. Federal State Specific Legally In-Force Requirements

B1. Germany: Chemical Prohibition Ordinance (ChemVerbotsV)²

(1) Laminated and non-laminated composite wood-based panels (chipboard, block-board panels, veneer boards, fiberboards) must not be placed on the market, if the Formaldehyde steady state concentration (equilibrium concentration) caused by the tested composite wood-based panel exceeds the threshold concentration limit of $0.1 \text{ ml}/\text{cbm}$ (ppm) in the air of the test chamber.

- (a) Reference method⁴:
- EN 16516⁵: Emission measurement in a test chamber, average mean concentration on basis of a duplicate determination at the 28th day of conditioning as steady-state concentration (conditioning parameters: air exchange rate $n_{\text{TC}} = 0.5 \text{ h}^{-1}$, area-specific air exchange rate $q_{\text{fl}} = 0.28 \text{ m}^3/\text{m}^2\text{h}$, loading factor $L_{\text{TC}} = 1.8 \text{ m}^2/\text{m}^3$, temperature of inlet air $T_{\text{TC}} = 23 \pm 2 \text{ }^\circ\text{C}$, relative humidity $r.H_{\text{TC}} = 50 \pm 5 \%$, partially covering of open edges: ratio of test sample extent (sample size) to test sample surface area = $1.5 \text{ m}/\text{m}^2$).
- (b) additionally usable/applicable method: EN 717-1³: Emission measurement in a test chamber, the quantified FMA steady-state concentration value has to be multiplied by a factor of 2.

(2) Furniture containing or made up of composite wood-based panels in non-compliance with requirements defined in paragraph (1) must not be placed on the market. However, paragraph (1) is equally fulfilled, if the furniture shows compliance with the steady-state concentration according to clause (1) in the scope of an entire object emission test.

CAVEAT: According to attachment 8, item 2.2.1, of the „Pattern Administrative Regulations on Technical Construction Rules“ (MVV TB)⁶ (requirements for construction works with regard to related health protection issues) requirements for specified construction products are implemented regarding the emission of volatile organic compounds (VOC), if the construction products are installed in interior common rooms or in rooms structurally not separated from them.

Inter alia following construction products are concerned:

- Composite wood-based panels in type of oriented strand boards (OSB) and synthetic resin bound chipboards,
- Decorative high pressure laminates (HPL).

The chamber test must be performed in full compliance with the specifications defined in the laboratory manual⁷ edited by the German Institute for Technical Engineering (DIBt), and can be accomplished exclusively by test, surveillance and certification bodies (PÜZ) notified at DIBt according to federal state building law. The correlating specifications in the state building codes of the federal states have to be respected separately.

B2. Austria: Ordinance on Formaldehyde⁸ § 1

(1) Composite wood-based panels in the sense of this ordinance – including chipboards, laminated chipboards, blockboards, veneer panels, single-layered or multiple-layered solid wood panels (panels of natural wood) and fiberboards including medium density fiberboards (MDF) – must not be placed on the market, if the Formaldehyde steady-state concentration caused by the composite wood-based panel exceeds the threshold concentration limit of 0.1 ml/m³ (ppm) in the test chamber air.

(2) The steady-state concentration has to be determined on basis of the method specified in the attachment of the ordinance or on basis of an equivalent method respecting the current scientific state of the art technology. Derived (secondary) test methods are permissible, if they correlate with the current scientific state of the art technology, and adequately hedged correlation values due to the equilibrium concentration in a test chamber are available.

(3) Furniture, wall panelling and related products must not be marketed, if they include composite wood-based panels that are non-compliant with the requirements set out in paragraph (1).

- Reference method: Annex to §1 paragraph (2)⁹ (conditioning parameters: air exchange rate $n_{TC} = 1.0 \text{ h}^{-1}$, loading

factor $L_{TC} = 1.0 \text{ m}^2/\text{m}^3$, temperature inlet air $T_{TC} = 23 \pm 0.5 \text{ }^\circ\text{C}$, relative humidity $r.H_{TC} = 45 \pm 3 \%$).

B3. Denmark: BEK 289¹⁰

§ 1. Spånplader, krydsfinerplader og lignende plader, hvori der indgår lim, der afspalter formaldehyd, må kun anvendes i møbler, inventar og lignende, såfremt de ved afprøvning i klimakammer højst afgiver så meget formaldehyd, at ligevægtskoncentrationen ikke overstiger 0,15 mg/m³ luft.

B4. Sweden: KIFS 2017:7¹¹

8 kap. Formaldehyd i träbaserade skivor
Kvalitetssäkring vid tillverkning och införsel
Emissionsgränsvärde

- 3 § Träbaserade skivor som tillverkas eller förs in till Sverige får inte avge mer formaldehyd än
- 1. 0,124 mg/m³ luft vid provning enligt standarden SS-EN 717-1:2004, eller.
- 2. vad som med säkerhet inte överstiger detta emissionsgränsvärde i en likvärdig standard för emissionsprovning av träbaserade skivor. Träbaserade skivor som är CE-märkta enligt klass E1 ska anses uppfylla kraven i första stycket.

Kravet i första stycket gäller råa skivor utan något ytiskt.

Conclusion: Wood-based panels (i.e., chipboard, plywood, fiberboard, laminated wood) manufactured in Sweden using Formaldehyde based additives or imported to Sweden, must not release a higher Formaldehyde concentration than 0.124 mg/m³. Products exceeding this threshold concentration limit must not be sold, transferred through Sweden or used professionally.

- Reference method: EN 717-1³.

B5. Italy: DECRETO 10 ottobre 2008¹²

Articoli 1

Vista la circolare n. 57 del 22 giugno 1983 del Ministero della salute, recante «Usi della formaldeide: rischi connessi alle possibili modalità di impiego» in cui e' previsto un limite di 0,1 ppm (0.124 mg/m³) negli ambienti di vita e soggiorno nei quali vengono utilizzati compensati, pannelli truciolati, di conglomerati in sughero.

- Reference method: EN 717-1³.

B6. France: Décret n° 2011-321¹³

Scope of application: flooring systems, wall panelling, ceiling coverings, partition walls, suspended ceilings, insulation materials, doors, windows.

Product classification in compliance with decree NOR: DEVL1104875A.

- Reference method: EN 16000-3¹⁴, 6¹⁵, 9¹⁶, 11¹⁷, loading scenarios according to specifications within EN 16516⁵ (refer to AgBB-Scheme¹⁸, CAVEAT: in dependence of the application scope or used scenario of the composite wood-based panel the loading ratio can differ from the

factor defined in the German Chemical Prohibition Ordinance (ChemVerbotsV)²¹!

- Defined and permissible Formaldehyde concentration classes: category C: > 120 µg/m³, category B: < 120 µg/m³, category A: < 60 µg/m³, category A+: < 10 µg/m³ (additionally: assessment of different VOC related categories).

B7. Belgium: BELGISCH STAATSBLAD Nr. 349, 15.12.2014¹⁹

Application scope of the Royal Decree according to annex 1, §1: inter alia

- Wood-based flooring systems or flooring systems made up of wood (floorboards, parquet, wood veneer flooring, wooden fiberboards, chipboards, oriented strand boards, multiplex boards).
- Reference method: EN 16516⁵ (the application scope for a flooring system requires a loading factor $L_{TC} = 0.4 \text{ m}^2/\text{m}^3$).
- Permissible Formaldehyde concentration: < 100 µg/m³ (additionally: VOC assessment according to annex 2 of the Royal Decree).

B8. Lithuania: Regulation draft²⁰

Scope of application: flexible, laminated and textile flooring systems

- Reference method: EN 717-1³.
- Permissible Formaldehyde concentration limit: ≤ 124 µg/m³ (additionally: VOC assessment on basis of the standards ISO 16000-6¹⁵ und 16000-9¹⁶).
- Threshold concentration limits to be respected according to concentration readings listed in Table 1).

B9. Norway, Spain, Turkey (non-EU state), Czech Republic

Pursuant to our current state of understanding and knowledge the marketability of composite wood-based panels in the aforementioned countries is equally linked to an FMA E1 quality. Reference documents are actually not available.

IMPLEMENTATION: MEANS OF APPLYING PROCEDURES

Private brand / label. In the procurement / sourcing phase.

A_EU Level

A. 1 Wood-based panels in the scope of harmonized standard EN 13986¹

- Both proof of the initial Formaldehyde testing and the correlating classification (E1/E2) of a wood-based panel type quality obligatory on basis of a test chamber examination respecting the specifications of EN 717-1³. The initial testing is in the responsibility of the manufacturer. [Remark: In case of provision of test chamber results by supplier / manufacturer for attention to QM department, the responsible should carefully check, if a test chamber lab accredited along with EN 717-1 has been involved in generating test results].

- Documentation of the applicable Formaldehyde emission quality class (E1/E2) on the Declaration of Performance (DoP) and the labeled CE mark (refer to information below).
- CE-marking of the wood-based panel
The CE-marking must be placed either on the panel itself or on the attached tag, and must reveal at least following information:
 - CE-Mark (appropriate size and appearance)
 - Identification of the manufacturer
 - Reference to the applicable harmonized European standard: EN 13986
 - Type of wood-based panel (technical class according to Annex A)
 - Nominal thickness
 - Formaldehyde class^a
 - Reaction to fire (class)
 - PCP (Pentachlorophenol, if concentration threshold limit > 5 ppm)
 - Treatment with wood preservatives (if any):

CAVEAT: If wood preservatives are used within the manufacturing process of the panel, the provisions of the „Chemical Law“ with special focus on Regulation (EC) 528/2012 (Biocidal Products Regulation) have to be respected whereby exclusively already approved biocides for product type 8 (“wood preservatives”) or substances actively involved in the application and decision process may be used as protective agents (refer to www.baua.de).

^aThe test specifications do not refer to wood-based panels which have been manufactured or processed with no Formaldehyde containing additives / resins. Consequently, this type of panels can be classified with E1 quality without any testing.

The performance characteristics of a wood-based panel evaluated due to characteristic features defined in EN 13986 may be declared by the manufacturer in the classes 1 to 4 related to the corresponding AVCP-system (Assessment and Verification of Constancy of Performance). If the „Constancy of Performance“ for the wood-based panel is declared in the classes 1, 2+ or 3, the assigned identification number(s) of the involved test and certification body(ies) notified with European legislation (Construction Products Regulation, CPR²¹) must be given on the CE-marking.

In general: If the constancy of performance for a construction product is declared in the AVCP-systems 1+, 1, 2+, the involved notified certification body

- has to issue a certificate confirming the “Constancy of Performance“ for the construction product applying the AVCP-systems 1+ und 1,
- has to issue a certificate on “Conformity of Factory Production Control“ applying the AVCP-System 2+. The documents have to be provided to third parties / market stakeholders in case of request.

Respecting the requirements of the Construction Products Regulation (CPR)²¹ a „Declaration of Performance“ (DoP) has to be set up and provided by manufacturer, and comprises the following information (refer to Annex III, CPR²¹):

- Reference to the product type
- The system / systems applied for verification and assessment of constancy of performance of the construction product
- Reference / release date of the harmonized European standard quoted for assessment of the construction product's essential characteristics
- Information on intended use of the construction product referring to applicable technical specification
- Listing of the essential characteristics established within the harmonized technical specification / standard related to the intended use
- The performance characteristic of at least one of the defined essential characteristics of the construction product
- The performance feature(s) of these essential characteristics of the construction product referring to the application purpose(s) for which obligations have to be considered in place where the manufacturer / distributor intends the product marketing (EU member state specific requirements)
- Listed essential characteristics for which no performance assessment has been performed must be identified with the abbreviation „NPD“ (No Performance Determined)

CAVEAT: The essential characteristics of a wood-based panel may be declared in the AVCP-systems 1, 2, 3 und 4 according to the provisions of the concerned harmonized standard. Raising the validity of the product's characteristics, the retailer / distributor – especially in case of a private label marketing of the product - may stipulate the approach that the manufacturer / supplier should assess the product characteristics in a higher AVCP-system class as basic level 4. However, this strategy implies increasing test, assessment and verification activities accompanied by a higher financial investment for the manufacturer / supplier and even the subsequently acting retailer.

IN CASE OF SELLING ACTIVITIES

If a construction product is placed on the market in the scope of a „private label sales activity“ (without active manufacturing of the product), the distributor (retailer) formally acts as „dummy manufacturer“ whereby all rights and obligations defined in CPR²¹ are transferred to the latter one. The obligations' shift mainly refers to the CE-marking process and the provision of a “Declaration of Performance“ (DoP).

In detail:

- Set up of a product related “Declaration of Performance“ including all required product specific characteristics. The DoP should be made accessible to the public, as minimum requirement on request of market stakeholders.
- Correct labeling of the product with the CE-Mark. If the product can't be directly labeled, all information must be provided on a product accompanying tag.

CAVEAT / Consequence: Wood-based panels manufactured in EU member state foreign regions and transferred (imported) to the German market must comply mandatorily with the Formaldehyde release provisions defined in the „Chemical Prohibition Ordinance“ (ChemVerbotsV)². An E1 quality emission class assigned to a wood-based panel type and accordingly documented on the corresponding DoP does not assure that the panel is compliant with German law (required quality level: E1/2).

B. Federal State Specific Requirements

IN THE SCOPE OF SOURCING

B1. Germany

Until 31.12.2019 the marketability of wood-based panels placed on the German market was legally bound to compliance with the Formaldehyde emission class E1 (≤ 0.1 ppm). However, with implementation of the new reference method based on provisions specified in EN 16516⁵, the announcement of conditioning parameters to be respected and published in the Federal Gazette⁴ and the simultaneous maintenance of the permissible Formaldehyde threshold concentration limit of 0.1 ppm for the maximum steady-state concentration according to provisions of “Chemical Prohibition Ordinance“ (ChemVerbotsV)², the legislative authority significantly tightened the quality criteria regarding the release of Formaldehyde from wood-based panels. Consequently, wood-based panels may comply with the maximum threshold concentration limit, if they correspond to an E1/2 emission class quality (≤ 0.05 ppm when tested along with provisions of EN 717-1³). E1 quality characterized wood-based panels in stock manufactured before 31.12.2019 can be continuously sold and used. Products manufactured as of 01.01.2020 and marketed in Germany must comply with the sharpened requirements.

Consequence: A wood-based panel manufactured using Formaldehyde containing formulations, and even compliant with EU legislation is maybe not marketable in Germany. Consequently, the following has to be considered both in the scope of sourcing from and delivering to third parties: An evidence on filed FMA test findings for the initial testing of a wood-based panel type using the test chamber method must be available. Different thicknesses of a wood-based panel type have to be evaluated separately. The evidence is based on a test report issued by an emission laboratory accredited for the standard EN 717-1³ and/or EN 16516⁵. Test data resulting from continuing internal factory production control activities (using permissible secondary test methods^{22,23}) should be provided by manufacturer / supplier to customer for each sourced batch of composite wood-based panel type. Correlation data for primary (test chamber) and secondary method (gas analysis, perforator method) should additionally be given by manufacturer / supplier (for a better understanding and interpretation of test results).

Note: On initiative of the European Chemicals Agency (ECHA) a proposal was already made public to harmonize both the evaluation procedure and the quality level for products which may contribute to the release of carcinogenic Formaldehyde whereby the concerned product scope is not exclusively limited to wood-based FMA releasing articles but also includes products with FMA releasing plastics components. The proposal is currently under lively stakeholder discussion, and references to provisions of the standard EN 717-1³ for quantifying the Formaldehyde release. The maximum threshold FMA concentration limit is actually specified with 0.1 ppm. In case of ratification and subsequent inclusion in Annex XVII of the REACH-Regulation²⁴ this provision (as directly applicable European law) would collide with German legislation.

B2. Austria

Within the application scope of the Austrian Formaldehyde Regulation⁸ and in addition to composite wood-based panels, one-layered and multi-layered solid wood boards are listed which have to be also evaluated for FMA release. The evidence on legal conformity is given, if test results gained via test chamber examinations or test readings on basis of derived test methods^{22,23} are available. The latter approach can be used, if a correlation between results from primary and secondary methods has been established. The manufacturer must provide conclusive data in form of test reports.

Consequence: If one-layered or multi-layered solid wood boards (that are not laminated) are sourced from Austria and sold as „private label“ products in Germany, consequently no test report proof regarding the Formaldehyde release must be provided since these board types are not covered by the scope of the German “Chemical Prohibition Ordinance” (ChemVerbotsV)². In contrast, if the solid wood boards are re-exported as private label products by the retailer to Austrian market, FMA tests are mandatorily applicable demonstrating legal conformity with Austrian regulation.

IN CASE OF SOURCING

B3. Denmark

Wood-based panels manufactured in Denmark and demonstrating full compliance with Danish legislation¹⁰ are non-compliant with German provisions (ChemVerbotsV)², if the concerned panels exploit the permissible Danish established threshold FMA concentration limit value. From Denmark imported wood-based panels must be tested and evaluated in accordance with the applicable reference test methods^{3,5} respecting the defined conditioning parameters. Test certificates presenting results from initial testing should be available.

IN CASE OF SELLING ACTIVITIES AND FOR MEANS OF MARKETING

Assurance and control of required FMA emission quality class according to provisions of German ChemVerbotsV²

include the provision check and review of test reports issued by notified and/or accredited emission labs. Moreover, test findings based on derived methods^{22,23} established by manufacturer and applied within the internal factory production control measures should be accessible and transferred to attention of retailer representatives. For interpreting and understanding batch specific test results related to reference (test chamber) and derived method(s) (perforator, gas analysis), the FMA value correlation (even reflecting the dependence of FMA load and thickness of the panel type) should be known and disclosed by manufacturer.

IN CASE OF SOURCING / SALES ACTIVITIES

B4. Sweden

Requirements / measures taken in analogy to explanations/ clarifications described under item B1.

IN CASE OF SOURCING / SALES ACTIVITIES

B5. Italy

Requirements / measures taken in analogy to explanations/ clarifications described under item B1.

IN CASE OF SOURCING

B6. France

Under the premises that a wood-based panel type sample has been emission tested considering both the application scenario “floor + wall + ceiling” and respecting the loading factor $L_{TC} = 1,8 \text{ m}^2/\text{m}^3$, exclusively wood-based panels already labeled with emission class A⁺ ($< 10 \text{ } \mu\text{g}/\text{m}^3$) and A ($< 60 \text{ } \mu\text{g}/\text{m}^3$) according to provision of French Decree may be compliant with German requirements (ChemVerbotsV²) in a high probability rate. Emission class B labeled products could be on the borderline. If the respected emission test specific loading factor for French classification differs from $L_{TC} = 1,8 \text{ m}^2/\text{m}^3$, the already available test results can't be definitely used for conformity considerations / check according to German law.

IN CASE OF SELLING ACTIVITIES

A test report issued by a notified / accredited emission test lab for each type and each thickness of a sourced and in France manufactured composite wood-based panel should be provided by manufacturer and / or supplier for means of proving FMA conformity with provisions of ChemVerbotsV².

IN CASE OF SOURCING

B7. Belgium

Despite using the identical reference method⁵, defining a permissible threshold FMA concentration limit of $< 100 \text{ } \mu\text{g}/\text{m}^3$ and formally undershooting the ChemVerbotsV² FMA limit ($\leq 124 \text{ } \mu\text{g}/\text{m}^3$), composite wood-based panels and related products manufactured in Belgium and imported to German market could not be compliant with German legislation since the FMA test results are based on different conditioning parameters respected in the emission evaluation ($L_{TC} = 0,4 \text{ m}^2/\text{m}^3$ vs $L_{TC} = 1,8 \text{ m}^2/\text{m}^3$).

IN CASE OF SELLING ACTIVITIES

A test report issued by a notified / accredited emission test lab for each type and each thickness of a sourced and in Belgium manufactured composite wood-based panel should be provided by manufacturer and/or supplier for means of proving FMA conformity with provisions of ChemVerbotsV².

B8. Lithuania

In our understanding the draft regulation²⁰ was not finally ratified up to date. Consequently, in Lithuania the CPR²¹ provisions are directly legally binding and the requirements defined in the applicable technical specification for wood-based panels (EN 13986¹) have to be respected. The composite wood-based panels listed in the scope of the harmonized standard must only be classified and allocated to the applicable FMA emission quality class E1 or E2.

IN CASE OF SOURCING / SELLING ACTIVITIES

Requirements / measures taken in analogy to explanations/ clarifications described under item B1.

ARTICLES OF MERCHANDISE

According to our legal understanding and interpretation all rights and obligations arising from CPR²¹ provisions remain in the responsibility of the initial distributor, the manufacturer, when the retailer is selling or merchandising composite wood-based panels referenced to the identification of the original manufacturer. The latter must provide a „Declaration of Performance“ (DoP) for third parties or market stakeholders, and is in charge of CE marking concerned products. A missing CE-mark indicates the fact that either no „Declaration of Performance“ document was created or no performance characteristic defined in the harmonized standard was declared by manufacturer. Wood-based panels in the scope of the applicable harmonized standard (EN 13986¹) must be classified with regard to the applicable FMA quality emission class. Both test reports on initial type testing and additionally test findings based on internal factory production control must be provided by manufacturer/supplier.

IN CASE OF SOURCING ACTIVITIES

The merchandising company (retailer) should exclusively source composite wood-based panels from suppliers / manufacturers that are voluntarily willing to provide batch specific test results (in form of test reports) for proving compliance with ChemVerbotsV² provisions.

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- ² Chemikalien-Verbotsverordnung vom 20. Januar 2017 (BGBl. I S. 94; 2018 I S. 1389), die zuletzt durch Artikel 5 des Gesetzes vom 18. Juli 2017 (BGBl. I S. 2774) geändert worden ist“. Stand: Zuletzt geändert durch Art. 5 G v. 18.7.2017 I 2774. Ersetzt V 8053-6-20 v. 14.10.1993 I 1720. (ChemVerbotsV).
- ³ EN 717-1: Wood-based panels - Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method; German version EN 717-1:2004.
- ⁴ Federal Gazette (BAnz) AT 26.11.2018 B2 – Current analytical methods.
- ⁵ EN 16516: Construction products – Assessment of release of dangerous substances – Determination of emissions into indoor air; German version EN 16516:2017.
- ⁶ German Institute for Technical Engineering (Deutsches Institut für Bautechnik, DIBt): Pattern Administrative Regulations on Technical Rules (MVV TB), Date of Edition: 2019/1.
- ⁷ German Institute for Technical Engineering (Deutsches Institut für Bautechnik, DIBt): Lab Manual for Notified Test Laboratories Regarding Health Protection Issues – Test and Analytical Methods for Health Assessment of Construction Products (document not commonly available).
- ⁸ Verordnung des Bundesministers für Umwelt, Jugend und Familie vom 12. Februar 1990 über Beschränkungen des Inverkehrsetzens und über die Kennzeichnung formaldehydhaltiger Stoffe, Zubereitungen und Fertigwaren (Formaldehydverordnung), StF: BGBl. Nr. 194/1990.
- ⁹ Based on provisions of EN 717-1³.
- ¹⁰ BEK nr. 289 af 22/06/1983: Bekendtgørelse om begrænsning af formaldehyd i spånplader, krydsfinerplader og lignende plader, som anvendes i møbler, inventar og lignende.
- ¹¹ Kemikalieinspektionens föreskrifter (KIFS 2017:7) om kemiska produkter och biotekniska organismer. Föreskrifterna senast ändrade genom KIFS 2019:2.
- ¹² Gazzetta Ufficiale Numero 28: DECRETO 10 ottobre 2008 – Disposizioni te a regolamentare l'emissione di aldeide formica da pannelli a base di legno e manufatti con essi realizzati in ambienti di vita e soggiorno. Roma: MINISTERO DEL LAVORO, DELLA SALUTE E DELLE POLITICHE SOCIALI 2008.
- ¹³ Décret n° 2011-321 du 23 mars 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils.
- ¹⁴ ISO 16000-3: Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method (ISO 16000-3:2011).
- ¹⁵ ISO 16000-6: Indoor air – Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA[®] sorbent, thermal desorption and gas chromatography using MS or MS-FID (ISO 16000-6:2011).
- ¹⁶ EN ISO 16000-9: Indoor air – Part 9: Determination of the emission of volatile organic compounds from building products and furnishing – Emission test chamber method (ISO 16000-9:2006); German version EN ISO 16000-9:2006.
- ¹⁷ EN ISO 16000-11: Indoor air – Part 11: Determination of the emission of volatile organic compounds from building products and furnishing – Sampling, storage of samples and preparation of test specimens (ISO 16000-11:2006); German version EN ISO 16000-11:2006.
- ¹⁸ AgBB-Scheme, August 2018: Requirements for Indoor Air Quality in Buildings: Health Assessment for Emissions of Volatile Organic Compounds (VVOC, VOC und SVOC) from Construction Products including updated NIK-Value listing of 2018 in part 3.
- ¹⁹ BELGISCH STAATSBLED Nr. 349: 8 MEI 2014. – Koninklijk besluit tot vaststelling van de drempelniveaus voor de emissies naar het binnenmilieu van bouwproducten voor bepaalde beoogde gebruiken. Duitse vertaling, bl. 101235.
- ²⁰ Draft Regulation: Regulation for Revision of the Regulation No. V-895 of the Minister of Health of the Republic Lithuania dated from 09th December 2004 and for Confirmation of the Lithuanian Hygiene Standard NH 105:2004 for Polymer Construction Products and Polymeric Furniture Components (Wilna 2014).
- ²¹ REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.
- ²² EN ISO 12460-3: Wood-based panels – Determination of formaldehyde release – Part 3: Gas analysis method (ISO 12460-3:2015); German version EN ISO 12460-3:2015.
- ²³ EN ISO 12460-5: Wood-based panels - Determination of formaldehyde release - Part 5: Extraction method (called the perforator method) (ISO 12460-5:2015).
- ²⁴ REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

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