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Formaldehyde Emissions from Compressed Wood Products

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AUSTRALIA

FORMALDEHYDE EMISSIONS FROM COMPRESSED WOOD PRODUCTS

Executive Summary

In Australia formaldehyde emissions from compressed wood products are regulated by several national standards. Compliance with national standards is voluntary unless mandated by law.

I. Formaldehyde in Residences and Offices

A 2001 government report on air toxics and indoor air quality in Australia concluded:

> *[F]ormaldehyde concentrations have been found to be low in conventional, established residences and offices, with mean concentrations of 30-85 µg/m3, well below the NHMRC* [National Health and Medical Research Council] *goal of 130 µg/m3(0.1 ppm).*[1] *However, concentrations up to 1500 µg/m3 with means of 120-920 µg/m3 have been reported in mobile buildings, probably due to the high content of pressed-wood products and low ventilation rates in these buildings. Concentrations exceeding the goal have also been observed in residences recently insulated with urea-formaldehyde foam insulation (UFFI), although, after several months, when the foam has dried, formaldehyde concentrations are generally below the NHMRC goal* [and that while] *formaldehyde concentrations in conventional Australian buildings appear to be somewhat lower than those reported in North America, those in mobile buildings are similar.*[2]

In November 2006 the Australian Government Department of Health and Aging, National Industrial Chemicals Notification and Assessment Scheme, released a Priority Existing Chemical Report (Report No. 28) on formaldehyde, meaning that formaldehyde is no longer considered a Priority Existing Chemical and therefore manufacturers and importers no longer require an assessment prior to its importation or manufacture.[3] Manufacturers and importers must still, however, comply with any other obligations under the Industrial Chemicals (Notification and Assessment) Act 1989 (Cth). The purpose of

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[1] This goal was contained in the publication, AMBIENT AIR QUALITY GOALS AND INTERIM NATIONAL INDOOR AIR QUALITY GOALS, which was rescinded in March 2002. An archieved copy is available at: http://www.nhmrc.gov.au/publications/synopses/eh23.htm. Rescinded publications no longer represent the Council's position on the matters contained therein.

[2] Australian Government, Dept. Of Environment, Water, Heritage & the Arts, AIR TOXICS AND INDOOR AIR QUALITY IN AUSTRALIA: STATE OF KNOWLEDGE REPORT (Environment Australia, 2001), ISBN 0 6425 4739 4, *available at*: http://www.environment.gov.au/atmosphere/airquality/publications/sok/chapter7.html (last visited June 2, 2008).

[3] Australian Government, Department of Health and Ageing, National Industrial Chemicals Notification and Assessment Scheme, PRIORITY EXISTING CHEMICAL REPORT NO. 28 (November 2006), *available at*: http://www.nicnas.gov.au/publications/car/pec/PEC28/PEC_28_Full_Report_PDF.pdf (last visited June 3, 2008).

this Act is, among other things, to implement a national system of notification and assessment of industrial chemicals.

II. Australian Standards

Australia has several standards that are applicable to formaldehyde emissions from compressed wood products. These include:

AS/NZS 2098.11:2005
Methods of test for veneer and plywood - Determination of formaldehyde emissions for plywood;

AS 2365.6-1995
Methods for the sampling and analysis of indoor air - Determination of formaldehyde - Impinger sampling - Chromotropic acid method;

AS/NZS 4266.16:2004
Reconstituted wood-based panels - Methods of test - Formaldehyde emission - Desiccator method;

AS/NZS 4266.16:2004/Amdt 1:2006
Reconstituted wood-based panels - Methods of test - Formaldehyde emission - Desiccator method; and

AS/NZS 4357.4:2005
Structural laminated veneer lumber - Determination of formaldehyde emissions.

Copies of Australian standards are available on a payment basis from SAI Global, http://www.saiglobal.com/shop/Script/Result.asp?SearchType=simple&Sort=ANSI&Status=all&Gst=1&Max=15&Db=AS&DegnKeyword=formaldehyde (last visited June 2, 2008). The cost for each standard varies but the total cost for the above standards is $150.55 AUD (about US$145).[4]

Compliance with some of these standards may be certified by authorized certification bodies such as the Australian Wood Panel Association, Inc.[5]

III. Legal Enforcement of Australian Standards

Generally, compliance with Australian Standards is voluntary unless mandated by law. However compliance with a relevant Australian Standard will not, per se, ensure compliance with other legal obligations under consumer protection laws.[6]

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[4] At a current exchange rate of 1 AUD = US$0.961292. The Law Library of Congress was unable to purchase a subscription due to restrictive terms of contract.

[5] Australian Wood Panel Association, Inc., claims to certify compliance with, *e.g.*, AS/NZS 4266.16 2004; see the Association's Web site at: http://www.woodpanels.org.au/testcentre/certification/jas_anz.asp) (last visited June 3, 2008).

[6] See Undertaking to the Australian Competition and Consumer Commission for the purposes of Section 87B [of the Trade Practices Act 1974 (Cth)], by Paddy Pallin Pty Ltd ACN 001 204 931, in Relation to Down Filled Sleeping Bags, available at the Australian Competition & Consumer Commission Web site, http://www.accc.gov.au/content/item.phtml?itemId=713287&nodeId=4e8f63395ec7d7f9a90a0daa8c2bffa5&fn=Undertaking.pdf (last visited June 4, 2008). In this instance the company complied with the Australian Standards in relation to labeling of down filled products but was still found to be in breach of the consumer protection provisions of the Trade Practices Act 1974 (Cth).

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FORMALDEHYDE EMISSIONS FROM COMPRESSED WOOD PRODUCTS

CANADA

In Canada, regulations on emissions from compressed wood products analogous to California's new standards are entrusted to provincial governments in the exercise of their powers to establish building codes and also to the federal government under its powers to control hazardous substances governed by the Canadian Environmental Protection Act.[1] However, no federal or provincial governments have adopted general regulations for formaldehyde emissions from compressed wood products used in construction. Nevertheless, as has been reported by Health Canada, "concerns about potential health impacts from these emissions led the wood products industry to adopt voluntary standards on formaldehyde emissions from particle board (ANSI 208.1) and medium-density fibre (MDF) board (ANSI 208.2) in the 1990's."[2] Thus, Canadian manufacturers voluntarily adopted the same standards adopted in the United States. There are no standards for plywood and other types of laminates.

Health Canada has also published guidelines for indoor air quality respecting formaldehyde. In 2005, the following guidelines were published:

> It is recommended that a guideline be established for short-term (1-hour averaged) exposures to formaldehyde at 123 μg/m^3 (100 ppb) (i.e. one tenth of the lowest concentration at which eye irritation was reported in the 1993 Kulle et al. controlled exposure study).
>
> It is recommended that the guideline for long-term (8-hour averaged) exposure to formaldehyde be based on the NOAEL derived from the Rumchev (2002) case-control study of childhood asthma. Based on this study, the guideline would be 50 μg/m^3 (40 ppb). Although formaldehyde is probably carcinogenic to humans, the cancer risk associated with a lifelong exposure to that concentration of formaldehyde is estimated to be negligible.[3]

These guidelines do not appear to have been incorporated in any regulations.

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[1] 1999 S.C. c. 33 (official source).

[2] Health Canada, *Proposed Residential Indoor Air Quality Guidelines for Formaldehyde*, c. 3.2.1, 2005, *available at* http://www.hc-sc.gc.ca/ewh-semt/pubs/air/formaldehyde/index-eng.php.

[3] *Id.*, at c. 6.4.

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FORMALDEHYDE EMISSIONS FROM COMPRESSED WOOD PRODUCTS

GERMANY

German law provides that composite wood products may not be marketed if the formaldehyde emissions caused by them in an enclosed testing area exceed 0.1 milliliter per cubic meter, which equals 0.1ppm [parts per million]. Furniture that contains composite wood products is held to the same standard, which, however, is deemed to be met if the entire piece of furniture [not only its wood particle component] is below the emissions threshold. These restrictions are expressed in Appendix 1, number 3 of the Prohibited Chemicals Regulation[1] that in turn is based on the German Chemicals Act,[2] which contains broad provisions on protecting human beings and the environment from dangerous substances.

The Prohibited Chemicals Regulation uses the (CAS registry number[3] 50-00-0) for formaldehyde, and it describes the restricted wood products as: "Coated and uncoated wooden materials (particle board, carpenter's board, veneer, and fiber board)."

The Regulation does not specify the testing methods. Instead, the Regulation provides that the Federal Ministry for the Environment, Nature Conservancy, and Nuclear Reactor Safety must publish the up-to-date, proper methods for testing all the substances restricted by the Regulation.[4]

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[1] Verordnung über Verbote und Beschränkungen des Inverkehrsbringens gefährlicher Stoffe, Zubereitungen, und Erzeugnisse nach dem Chemikaliengesetz, June 13, 2003, [ChemVerbotsV], BUNDESGESETZBLATT [BGBl, official law gazette of the Federal Republic of Germany] I at 872, as last amended, § 1 in conjunction with Anhang 1, Abschnitt 3.

[2] Chemikaliengesetz, repromulgated June 20, 2002, BGBl I at 2090, as amended.

[3] As provided by the American Chemicals Society, http://www.cas.org/expertise/cascontent/registry/regsys. html(last visited June 4, 2008).

[4] ChemVerbotsG, § 1 ¶ 5.

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JAPAN

FORMALDEHYDE EMISSIONS FROM COMPRESSED WOOD PRODUCTS

Executive Summary

Formaldehyde emissions from building materials, including compressed wood products, are regulated in Japan. Compressed wood products that emit more than 0.12 mgs. of formaldehyde per square meter per hour during summer cannot be used for indoor building surfaces unless the buildings have efficient ventilation mechanisms. Those materials that emit less formaldehyde may be used for indoor surfaces, but the total amount of the usage area is restricted, depending on the emissions rate of the material and the building's ventilation capacities.

I. Building Standards

Japan regulates formaldehyde emissions from building materials, including compressed wood products. The 2002 Building Standards Law Amendment included measures against so-called "sick houses."[1] There have been reports that people who moved into new houses and apartments became sick from chemicals emitted by new building materials. Since the 2002 Amendment became effective in July 2003, the Building Standards Law regulates the use of two harmful substances, chlorpyrifos and formaldehyde, in interior building materials.[2] The Building Standards Law Enforcement Order sets forth detailed standards.[3] The permitted use of building materials containing formaldehyde depends on three categories of materials, classified by formaldehyde emission levels, as follows:[4]

- Class 1 Formaldehyde Emitting Building Materials

Building materials, including compressed wood products, that emit more than 0.12 mgs. of formaldehyde per square meter of their surface per hour during summer are prohibited for use

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[1] The Law to amend the Building Standards Law, Law No. 85 of 2002, *available at* http://www.shugiin.go.jp/itdb_housei.nsf/html/housei/15420020712085.htm (government Web site, unofficial source).

[2] Kenchiku kijun hō [Building Standards Law], Law No. 201 of 1950, *as amended*, art. 28-2, item 3, *available at* http://law.e-gov.go.jp/htmldata/S25/S25HO201.html (government Web site, unofficial source); Kenchiku kijun ho shikō rei [Building Standards Law Enforcement Order], Order No. 338 of 1950, *as amended*, art. 20-5, *available at* http://law.e-gov.go.jp/htmldata/S25/S25SE338.html (government Web site, unofficial source).

[3] Building Standards Law Enforcement Order, *supra* note 2, art. 20-7, -8, and -9.

[4] Dai isshu horumuarudehido hassan kenchiku zairyo o sadameru ken [Regarding designation of category 1 building materials emitting folmaldehyde], Ministry of Land, Infrastructure and Transportation (MLIT) Notification No. 1113 (Dec. 26, 2002), *as amended* by MLIT Notification No. 1483 of 2003 (Nov. 25, 2003); Dai ni shu horumuarudehido hassan kenchiku zairyo o sadameru ken [Regarding designation of category 2 building materials emitting folmaldehyde], MLIT Notification No. 1114 (Dec. 26, 2002), *as amended* by MLIT Notification No. 1484 of 2003 (Nov. 25, 2003); and Dai san shu horumuarudehido hassan kenchiku zairyo o sadameru ken [Regarding designation of category 3 building materials emitting folmaldehyde], MLIT Notification No. 1115 (Dec. 26, 2002), *as amended* by MLIT Notification No. 1485 of 2003 (Nov. 25, 2003), *all three are available at* http://www.mlit.go.jp/jutakukentiku/build/kensetu.files/031127kokuji.pdf (government Web site, unofficial source).

in interior building surfaces, such as walls, floors, ceilings, and doors, as well as shelves, cabinets, and kitchen counters that are affixed to the building.[5]

- Class 2 Formaldehyde Emitting Building Materials

Building materials, including compressed wood products, that emit 0.02 to 0.12 mgs. of formaldehyde per square meter of their surface per hour during summer may be used for interior building surfaces, depending on the intended use of the building in question and the function of its ventilation system. For example, in the case of rooms of houses and offices with ventilation mechanisms that meet specified ventilation abilities,[6] such materials are permissible if the surface area of the material multiplied by 1.20 does not exceed the floor area of the room where it is used.[7]

- Class 3 Formaldehyde Emitting Building Materials

Building materials, including compressed wood products, that emit 0.05 to 0.02 mgs. of formaldehyde per square meter of their surface per hour during summer can be used for interior building surfaces, depending on the intended use of the building in question and the function of its ventilation system. For example, in the case of rooms of houses and offices with ventilation mechanisms that meet specified ventilation abilities, such materials are permissible if the surface area of the material multiplied by 0.20 does not exceed the floor area of the room.[8]

Other numbers to calculate permitted usage are as follows:[9]

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[5] Building Standards Law Enforcement Order, Order No. 338 of 1950, *as amended*, art. 20-7, para. 1, item 1; Kenshiku kijun ho ni motoduku sikku hausu taisaku ni tsuite [Regarding measures against sick houses in the Building Standards Law], MLIT, http://www.mlit.go.jp/jutakukentiku/build/sickhouse.html (last visited June 4, 2008).

[6] The technical standards for such ventilation systems are established by art. 20-8 of the Building Standards Law Enforcement Order. *Id*. art. 20-8.

[7] *Id*. art 20-7, para. 1, item 2.

[8] *Id*.

[9] *Id.*

	Habitable Rooms in Residences		Habitable Rooms in Non-residences		
	The rate of ventilation is 0.7 times/hr or more	Less ventilation	The rate of ventilation is 0.7 times/hr or more	The rate of ventilation is 0.5 to 0.7 times/hr	Less ventilation
Class 2 Formaldehyde Emitting Building Materials Multipliers	1.20	2.80	0.88	1.40	3.00
Class 3 Formaldehyde Emitting Building Materials Multipliers	0.20	0.50	0.15	0.25	0.50

In order to counter "sick house" problems, all new buildings for which construction started after July 1, 2003, must have ventilation devices or mechanisms specified by the government.[10] When a building is equipped with a central ventilation system with specified abilities, the above restrictions are not applied.[11]

Corresponding to the Building Standards Law and its Enforcement Order Amendments, the Ministry of Agriculture, Forestry and Fisheries amended its certification system (JAS System)[12] for forestry products, including compressed wood products. Compressed wood products are classified in categories that correspond to those under the Building Standards Law Enforcement Order, and are labeled accordingly.[13]

II. Furniture Not Regulated

Formaldehyde emission from compressed wood used in furniture is not regulated, although shelves, cabinets and kitchen counters that are affixed to buildings are regulated by the Building Standards Law, as stated in Section I. As an industry labeling system, the Federation of Japan Furniture Manufacturers Association provides the "Indoor Environment-friendly Mark" system for its members.

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[10] *Id*. art. 20-8.

[11] *Id*. art. 20-7, para. 5.

[12] Nōrin busshi no kikaku ka oyobi hinshitsu hyōji no tekisei ka ni kansuru hōritsu [Law Concerning Standardization and Proper Labeling of Agricultural and Forestry Products], Law No.175, 1950, *as amended*, art. 7, available at http://law.e-gov.go.jp/htmldata/S25/S25HO175.html (government website, unofficial source).

[13] There are several standards, depending on products. For example, there is a standards for plywood: Shūsei zai no nihon nōrin kikaku [JAS Standards for Plywood], Ministry of Agriculture, Forestry and Fishery (MAFF) Notification No. 1152 (Sept. 25, 2007), *available at* http://www.maff.go.jp/j/jas/jas_kikaku/pdf/kikaku_53.pdf (MAFF website, unofficial source).

The mark can be attached only to members' furniture that is made with materials, including compressed wood, that emit formaldehyde with very low levels and paint without formaldehyde.[14]

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[14] Indoor Environment-friendly Mark, Federation of Japan Furniture Manufacturers Association, http://www.zkr.or.jp/mark.html (last visited June 2, 2008).

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MALAYSIA

FORMALDEHYDE EMISSIONS FROM COMPRESSED WOOD PRODUCTS

I. Malaysian Standards

Malaysia has two main standards that are relevant to formaldehyde emissions from compressed wood products. These are:

MS 1787: PART 14:2005 (MYR20) Wood-Based Panels - Part 14: Determination of Formaldehyde Content by Perforator Method; and

MS 1787: PART 15:2005 (MYR20) Wood-Based Panels - Part 15: Determination of Formaldehyde Emission by Desiccator Method.

Copies of Malaysian Standards may be purchased from the Malaysian Standards Online Web site at: http://www.msonline.gov.my/msonline/registrationAction.do?actionname=Default (last visited June 4, 2008), at a cost of approximately 10MYR each (about US$3.00).[1]

II. Legal enforcement of Malaysian Standards

Malaysian Standards are developed under the Standards of Malaysia Act 1996 (Act 549). Compliance with a Malaysian Standard is voluntary unless such compliance has been mandated by law; however, compliance per se does not equate to immunity from legal obligations.[2]

It is an offense to indicate (whether by statement, representation, or symbol) that a product, process, practice, or service complies with a Malaysian Standard when the product, process, practice, or service does not so comply.[3]

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[1] At a current exchange rate of 1 MYR = US$0.308227. The Law Library of Congress was unable to purchase a subscription due to restrictive terms of contract.

[2] Disclaimer included in introduction to each standard.

[3] Standards of Malaysia Act 1996 (Act 549), § 18(b).

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FORMALDEHYDE EMISSIONS FROM COMPRESSED WOOD PRODUCTS

PORTUGAL

The researched Portuguese legislation does not contain any specific regulation, standard, or provision for formaldehyde emissions from compressed wood products.

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