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Statutory authority

Canadian Environmental Protection Act, 1999

Sponsoring departments

Department of Health
Department of the Environment

REGULATORY IMPACT ANALYSIS STATEMENT

(*This statement is not part of the Regulations*.)

Issues

Composite wood products are a significant source of formaldehyde in indoor environments. Formaldehyde in indoor air can cause irritation of the eyes, nose, and throat and can worsen asthma symptoms, especially in children. At higher levels, such as those that have been measured in some workplace environments, formaldehyde has been associated with cancer of the nasal passageways. At present, there are no Government of Canada regulations that set out limits for the amount of formaldehyde that can be used in composite wood products imported, sold or offered for sale in Canada, or on the level of formaldehyde emissions that these products can give off. Although voluntary industry standards do exist, testing indicates that some products currently imported and sold in Canada give off formaldehyde emissions that exceed the standard and could pose a risk to human health.

In order to help reduce health risks to Canadians, the Government of Canada is proposing the *Formaldehyde Emissions from Composite Wood Products Regulations* (the proposed Regulations). These Regulations would be enacted under the authority of the *Canadian Environmental Protection Act, 1999* (CEPA). These Regulations would place limits on the allowable formaldehyde emissions from composite wood products imported into, sold or offered for sale in Canada.

The proposed Regulations would align Canadian formaldehyde emissions requirements for composite wood products with similar requirements in the United States. This alignment will help ensure a level playing field between Canadian and American businesses, and reduce unnecessary industry burden and economic costs associated with meeting the health objectives of the Regulations.

Background

General

Formaldehyde is a colourless gas that has a wide variety of uses and sources. It can be dissolved in liquids and used as a preservative, and it is also often used as a component of glues or bonding agents. Formaldehyde gas has a sharp odour that is easily detectable at high levels.

Formaldehyde can be created by both natural and anthropogenic (human activity) sources. Normal biological processes in humans and many other animals generate small amounts of formaldehyde, and low levels of formaldehyde are present in the natural environment. Higher levels of formaldehyde can occur indoors as a result of human activity. Some of the most significant formaldehyde sources include emissions from composite wood products and emissions generated by combustion, particularly cigarette smoking, use of fireplaces, and cooking fuels. Other sources of formaldehyde in homes include paints and varnishes, glues, floor finishes, and certain types of paper and cardboard.

The health effects of exposure to formaldehyde have been well studied. While very low levels of formaldehyde do not pose a health concern, elevated levels of formaldehyde exposure are known to cause a number of human health concerns. Short-term exposure to high levels of formaldehyde can cause acute health problems, including irritation of the eyes, nose and throat, and may worsen asthma symptoms, particularly in children. Long-term exposure to lower levels of formaldehyde may also result in chronic problems, including respiratory symptoms and allergic sensitivity in children. At particularly high exposure levels, well above the levels where irritation and inflammation begin to be noticeable,

formaldehyde exposure may lead to cancer of the nasal passageways. Formaldehyde has been classified as a Group 1 carcinogen (i.e. considered carcinogenic to humans) by the International Agency for Research on Cancer (IARC). It is also listed as a toxic substance under Schedule 1 of the *Canadian Environmental Protection Act, 1999*.

Formaldehyde has been extensively used in the manufacturing of composite wood products. Composite wood products are products that are made out of multiple smaller pieces of wood glued together. The most well-known examples are plywood and particleboard, but other composite wood products exist, such as medium-density fibreboard and laminated wood products. Formaldehyde is often used as one of the chemicals in the glues that hold these composite wood products together. Over time, products that have been manufactured with formaldehyde-based glues and resins can give off formaldehyde emissions. These emissions are highest when the products are newly manufactured, and generally decline over time.

Composite wood products have many uses in Canadian homes, including use in furniture (especially the use of particleboard in inexpensive bookshelves and similar items), flooring, and wall panelling and trim. Off-gassing of formaldehyde from these products can be one of the main contributors to elevated formaldehyde levels and exposure in Canadian homes.

Today, formaldehyde use in the manufacturing of composite wood products is less common in Canada than it used to be, and when it is used, the quantities of formaldehyde are typically much lower than in historical uses. However, formaldehyde use in composite wood products is still common in some international jurisdictions. Imported composite wood products can have formaldehyde content and formaldehyde emission levels considerably higher than is typical of Canadian-made products.

Statistics on total imports of formaldehyde-containing composite wood products are not available, but Canada does import significant volumes of products that may contain formaldehyde. In 2017, Canada imported $3.5 billion worth of manufactured wood products, including $1.5 billion worth of veneer, plywood, and engineered wood products. Imports of veneer, plywood, and engineered wood products have been steadily increasing since 2013, when they were only worth $1.1 billion. In 2017, Canada also imported $280 million worth of wood kitchen cabinets and countertops, $300 million worth of wooden office furniture, and $1 billion worth of “other” wooden household furniture.

In almost all cases, imports come primarily from the United States and China. Imports from the United States are slightly higher for unfinished products and those that need to be installed. Chinese imports are slightly higher for finished wood products. The United States and China combined account for 60% to 80% of Canadian imports across most product categories that include composite wood products. Both the United States and China have maintained a fairly consistent market share of Canadian imports since 2010.

For context, while Canada imported $3.5 billion worth of manufactured wood products, domestic manufacturers produced $17.4 billion worth of manufactured wood products for export, and generated $11.2 billion in value added for the Canadian economy. So while Canada does import significant volumes of manufactured wood products, including composite wood products, the domestic manufacturing industry is significantly larger than the import sector.

It is unknown what the formaldehyde content or emission rates are for imported composite wood products. The State of California has had a formaldehyde emission standard for composite wood products for some time and the U.S. Environmental Protection Agency (EPA) recently enacted a similar rule (see “International risk management” section below). It is expected that most U.S. imports would meet the California or EPA standard. Imports from China and other overseas countries are expected to have higher formaldehyde emission levels than U.S. imports; however, comprehensive testing of imports has not been completed. Some limited testing by the National Research Council of Canada has been done and showed that at least some imported products currently produce formaldehyde emissions above the California standard.

Canadian regulations and risk management

The Government of Canada has introduced and modified a number of regulations over the years to help reduce formaldehyde exposure. Fuel combustion is a common source of formaldehyde and several recent fuel-related regulations have addressed formaldehyde emissions, including the following:

- *Off-Road Compression-Ignition Engine Emission Regulations*; and
- *Off-Road Small Spark-Ignition Engine Emission Regulations*.

In addition, the importation, advertisement, or sale of urea formaldehyde-based thermal insulation (urea-formaldehyde foam insulation or UFFI) has been prohibited in Canada since 1980. The prohibition was originally set out in Part I of Schedule I to the *Hazardous Products Act* to address formaldehyde-related hazards to human health posed by UFFI. In 2011, with the coming into force of the new *Canada Consumer Product Safety Act* (CCPSA), the prohibition was transferred to Schedule II of the CCPSA. Under the CCPSA, the prohibition applies to the manufacture, import, advertisement, or sale of consumer products that are urea formaldehyde-based thermal insulation, foamed in place, used to insulate buildings.

Health Canada's Residential Indoor Air Quality Guideline for formaldehyde provides recommended health-based maximum exposure limits for formaldehyde in Canadian homes. The short-term and long-term limits are as follows:

- Short-term exposure: 123 μg/m³ (100 parts per billion [ppb]) based on irritation of the eyes, nose or throat; and
- Long-term exposure: 50 μg/m³ (or 40 ppb) based on hospitalization for asthma in children.

Testing carried out in Canadian homes between 2007 and 2015 suggested that approximately 8% of Canadian homes had average formaldehyde levels above the recommended long-term exposure limit. These exposure limits are also considered to be protective against adverse health effects in all individuals, including children with asthma.

At present, there are no Government of Canada regulations that set out limits for the amount of formaldehyde released from composite wood products that can be used in Canadian homes.

Voluntary Canadian standard for composite wood products

In 2016, the Canadian Standards Association (CSA), working with industry and the Government of Canada, developed a voluntary standard for formaldehyde emissions from composite wood products. This standard is effectively the same as the one used in California (see next section). Products that are in compliance with the voluntary standard can be labelled as complying with the CSA standard. Most Canadian manufacturers have indicated that their products already comply with this voluntary standard. However, since the standard is voluntary, it is unknown whether all Canadian manufacturers currently meet the standard. Although comprehensive testing has not been carried out since the implementation of the standard, some limited testing by the National Research Council of Canada has been done and showed that at least some imported products currently produce formaldehyde emissions above the CSA standard.

International risk management

The health risks associated with formaldehyde have been noted by numerous international bodies, such as the IARC and the World Health Organization, as well as foreign regulators, such as the U.S. EPA.

In the United States, the California Air Resources Board (CARB) evaluated formaldehyde exposure and found that one of the major sources of exposure is from inhalation of formaldehyde emitted from composite wood products containing urea-formaldehyde resins. The CARB developed an airborne toxic control measure to limit formaldehyde emissions from composite wood products sold in the state. That measure has been in place since 2009.

In 2010, the United States Congress tasked the EPA with developing national regulations to manage formaldehyde emissions. The *Toxic Substances Control Act* (TSCA) Title VI rule, entitled *Formaldehyde Emission Standards for Composite Wood Products*, was published in July 2016, finalized in December 2016, and republished with amendments in October 2018. This rule requires composite wood products sold in or imported into the United States to comply with emission standards based on the CARB standards and also expanded the CARB requirements for a number of other categories of composite wood products. The EPA rule also includes requirements pertaining to testing, labelling, tracking, record keeping, certification, and stockpiling. The rule came into force on June 1, 2018, for most composite wood products and will come into force in March 2024 for laminated products.

In the European Union (EU), mandatory testing and labelling of formaldehyde off-gassing from wood products exists or has been proposed in certain jurisdictions, including Germany, France, and Denmark. Formaldehyde is currently being evaluated by France and the Netherlands under the Community Rolling Action Plan, based on concerns relating to human health. Under the EU's chemical management regime "REACH," registrants had until October 2017 to submit information regarding emission rates over time of formaldehyde into indoor air from major sources found in the indoor environment.

Various other countries have also developed, proposed, or implemented limits on formaldehyde emissions from wood products, including Mexico, Japan, Australia, and New Zealand.

Potential impacts of the U.S. EPA rule for Canada

New national mandatory limits on emissions of formaldehyde from composite wood products in the United States could pose problems in Canada, both for human health and for Canadian businesses.

If international companies that manufacture high-emitting formaldehyde composite wood products are no longer able to sell their products in the United States, there is a risk that they may try to dump those products on the Canadian market. It is unknown how significant this risk may be. But if Canada has less stringent regulations than the United States does, there is a non-trivial risk that Canada could start to see significantly more imports of composite wood products that have high formaldehyde content. This would further increase the risk to the health of Canadians.

On the manufacturing side, failure to align regulations with the United States could put Canadian manufacturers at a disadvantage. Most Canadian manufacturers of composite wood products sell their products in both Canada and the United States. If they face significantly different regulatory requirements in Canada and the United States, then they would be faced with three options: sell to only one market, which would result in a loss of sales; manufacture two separate product lines, one for each market, which would be inefficient; or manufacture a single product line that complies with both regulatory regimes, which would be costly and place them at a disadvantage relative to Canadian imports manufactured to a less stringent standard.

Objectives

The primary objective of the proposed Regulations is to reduce potential risks to the health of Canadians from exposure to formaldehyde by putting in place limits on allowable formaldehyde emissions from composite wood products.

The secondary objective of the proposed Regulations is to align Canadian requirements for composite wood products with similar requirements in the United States, in order to help create a level playing field among Canadian, American, and international businesses and reduce unnecessary costs to business associated with compliance with multiple regulatory requirements.

Description

This Regulatory Impact Analysis Statement accompanies the proposed Regulations, but is not itself part of the Regulations. Full details on the regulatory requirements are included in the Regulations themselves. The following is a summary of the main requirements under the proposed Regulations.

In order to reduce compliance costs for Canadian companies, and to facilitate regulatory alignment and create a level playing field with the United States, the proposed Regulations have been very closely aligned with the U.S. regulations. Emission limits under the proposed Regulations are the same as those in the U.S. regulations. There are some differences between the Canadian Regulations and the U.S. rule with respect to labelling, record keeping, and administrative requirements. For instance, the U.S. rule allows for compliance to be verified and reported on by third-party certifiers, whereas the Canadian Regulations require manufacturers to report directly to the Government. In addition, Canadian labels must be in both official languages, English and French, while the U.S. labels have no such requirement. These administrative differences have been included, and in some cases were required, to address unique Canadian circumstances and the Canadian legal and legislative framework. The administrative differences between the Canadian Regulations and the U.S. rule have been minimized where possible, and the few differences that exist are not expected to limit the ability of manufacturers to comply with the technical requirements of either regulatory tool.

Some of the technical elements of the Regulations are based on Canadian and international standards established by recognized standards organizations, such as the Canadian Standards Association (CSA), the American Society for Testing and Materials (ASTM), the American National Standards Institute (ANSI), the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC). These standards are not directly written into the regulatory text. Rather, the Regulations make reference to the published standards. This approach, known as “incorporation by reference,” ensures that regulatory requirements are consistent with established and well-understood industry standards. The manner in which the standards are incorporated into the Regulations also ensures that the regulatory requirements will change if and when the published standards change. The technical aspects of the Regulations that have been incorporated by reference to external documents include technical details on testing methods, accreditation, and application/non-application of certain provisions. The Regulations provide further details on which standards are incorporated by reference and what specific elements are included as part of the Regulations. Also incorporated by reference in the Regulations, however, in a static manner, is an internally generated document entitled *Directive Concerning Testing for Formaldehyde Emissions*. If the Regulations are approved, this would be an enforceable document that houses technical aspects of the Regulations. A draft may be found on the Government of Canada website.

The proposed Regulations would apply to the import, sale and offer for sale of composite wood products in Canada. With a few exceptions, the Regulations would apply to composite wood products for indoor use in Canada.

The proposed Regulations would establish the following maximum emission levels for formaldehyde emissions from composite wood products:

- 0.05 parts per million (ppm) for hardwood plywood;
- 0.09 ppm for particleboard;
- 0.11 ppm for medium-density fibreboard;
- 0.13 ppm for thin medium-density fibreboard; and
- 0.05 ppm for laminated products.

Composite wood products that emit formaldehyde gas above these levels could not be sold in, offered for sale in, or imported into Canada under the proposed Regulations unless they are exempted from the Regulations.

Products such as pallets and packaging materials that are not intended to be kept in people's homes, certain types of structural wood products, wood used in vessels and vehicles (other than mobile homes, motor homes, and recreational trailers), and a variety of highly specialized wood products would be exempted from the proposed Regulations. A full list of the exemptions is included in the Regulations.

Non-exempt composite wood products that are to be sold in Canada must be tested to ensure they meet the regulatory emission limits, and labelled as meeting the requirements before they may be sold in, offered for sale in or imported into Canada.

Product testing must be carried out on a routine basis, which is dependent upon the amount of manufacturing and product type, to ensure consistent emission levels (quality control). In addition, product testing must be conducted on a quarterly basis by an accredited laboratory to demonstrate consistency between the routine quality control test results and the emission test results generated by an accredited laboratory. The specific requirements for accreditation are set out in the proposed Regulations.

In certain cases, testing may be required less frequently, such as for manufacturers that are using no-added formaldehyde or ultra low-emitting formaldehyde resins. The specific testing requirements and testing frequency vary depending on the type and volume of products being tested. The testing requirements under the proposed Regulations would be essentially the same as the testing requirements under the U.S. rule.

All products that are required to be compliant with the proposed Regulations must be labelled prior to being sold or offered for sale in Canada. In some cases, if products are sold or offered for sale bundled together, then it may not be necessary to label each individual item. It may be sufficient to label the entire bundle. If the product is later unbundled for sale, then labelling may be required for each individual piece, as outlined in the proposed Regulations. Labels must be bilingual (English and French) and meet the other label requirements provided in the proposed Regulations. Some minor differences exist between the U.S. labelling requirements and those under the proposed Regulations, including, but not limited to, the bilingual requirement.

Certain products may qualify for alternative labelling if they meet additional standards. Products that are made without the use of formaldehyde can be labelled as "no-added formaldehyde" products. Some other products may qualify to be labelled as "ultra low-emitting formaldehyde" products. In both cases, there are alternative testing requirements that must be met in order to qualify for the alternative label. Those requirements are outlined in the proposed Regulations.

Manufacturers of panels and laminated products are required to keep records of product-testing results, records of production levels, the name of the individual, company or facility responsible for testing, customer information, shipping information, and various other records as specified in the Regulations. Manufacturers must provide an annual report to the Minister of the Environment containing most of this same information.

Importers, manufacturers of composite wood products, and retailers are required to document where their composite wood products came from and that their supplier verifies that the products are compliant with the Regulations. They must also verify that the products they buy and sell are labelled with the appropriate formaldehyde emission labels. All records must be maintained for a period of at least five years, and must be made available to the Minister of the Environment, or to purchasers, upon request.

The proposed Regulations would also involve proposing related amendments to the *Regulations Designating Regulatory Provisions for Purposes of Enforcement (Canadian Environmental Protection Act, 1999)* [the Designation Regulations]. The Designation Regulations identify provisions of various regulations made under CEPA as being subject to an enhanced fine range. These provisions are identified on the basis that violating them involves direct harm or risk of harm to the environment, or obstruction of authority. Designated sections of the Regulations would be added to the Schedule of the Designation Regulations to reflect the specific provisions designated.

These Regulations would come into force six months after publication of the final Regulations in the *Canada Gazette*, Part II. Most products imported, sold or offered for sale in Canada would need to comply with the applicable standards and regulatory requirements once the Regulations come into force, six months after publication. However, some laminated products would be exempted from the emission requirement until five years after the Regulations come into force. Additionally, products that were already manufactured or imported into Canada prior to the Regulations coming into force would be exempted from the emission requirements and could still be sold provided that they are sold within three years from when the Regulations come into force.

Qualitative discussion of costs and benefits

Industry cost summary — Low impact regulations

The cost of the proposed Regulations is expected to be low, meeting the threshold for "low impact" regulations with total costs estimated to be below $10 million in present value terms over a 10-year period. The total costs of the proposed Regulations are estimated to be $8.9 million over the 10-year total analytical period of 2020 to 2029.

Out of 580 Canadian production firms directly impacted by the proposed Regulations, it is expected that most Canadian manufacturers already meet the voluntary CSA standard, and are therefore already compliant with the proposed Regulations, so the incremental compliance costs to them would be negligible.

For those Canadian manufacturers who do not currently meet the voluntary CSA standard but sell products in the United States, it is expected that, in light of the new EPA standard, the majority of these companies will be upgrading their processes in order to continue selling in the United States. If they do upgrade in order to sell their products in the United States, then their products would also comply with the Canadian proposed Regulations. The incremental additional cost to these companies of complying with the Regulations would therefore also be negligible.

For those companies that are not currently manufacturing compliant products, and who have no interest in selling their products in the United States, the proposed Regulations would impose compliance costs, including one-time capital costs, ongoing operational costs, and product testing costs, some portion of which would be passed downstream in the form of slightly higher prices. However, it is estimated that only 20 out of 580 Canadian manufacturers fall into this category.

Given the overall low cost impacts of the proposed Regulations, following is a qualitative discussion of some of the expected costs and benefits of the proposed Regulations, with quantitative estimates included where they are available.

Product testing costs

For the estimated 20 companies that do not sell their products in the United States, product testing requirements under the proposed Regulations would vary depending upon the type of product and the frequency of testing. The average cost for product testing is estimated at $4,500 per quarter for most companies, though there is a range of uncertainty since tests for certain specialized products can cost as much as approximately $10,000.

Other costs

The approximately 2 100 companies that import, use or sell (but do not produce) composite wood products would be responsible for responding to requests from the government on records associated with their products. Since these companies are expected to already be keeping these records, the cost of responding to these requests is expected to be very low. The 560 companies that produce composite wood products and sell EPA compliant products in the United States would not be significantly impacted by the proposal. They would assume a one-time cost of $100 per firm to update existing product labels for Canadian-specific requirements, and an ongoing cost of $90 per year to keep records based on Canadian-specific requirements (assuming that these firms already keep records based on U.S. requirements). The estimated 20 Canadian companies that produce composite wood products and only sell in Canada would, however, be impacted by the proposal. These companies would assume a one-time cost of $300 per firm to familiarize themselves with the requirements of the proposed Regulations, and a one-time cost of $500 per firm to create labels for products for which a label was not previously required. These 20 companies would also assume an ongoing cost of $450 per year to keep records based on the regulatory requirements.

Benefits for Canadian panel and laminated wood product manufacturers

Domestic manufacturers may expect to benefit from the regulatory certainty provided by the Regulations. Most of the products being sold by Canadian manufacturers are made using methods that reduce formaldehyde emissions and conform to the EPA standards. Most products currently on the Canadian marketplace that do not already comply with the proposed Regulations are products produced in countries outside of North America, using lower-cost manufacturing methods that are then imported into Canada. Regulated limits on formaldehyde emissions would require that foreign manufacturers shift to more expensive manufacturing methods equivalent to Canadian manufacturers' methods if they wish to continue exporting their products to Canada. It is expected that this would slightly increase the cost to consumers, and slightly reduce the quantity, of composite wood products being imported to Canada.

Cost to downstream manufacturers

Fewer than 500 Canadian businesses buy composite wood products from upstream panel or laminated product manufacturers, and then use those composite wood products to create other products that they then sell, for example, a cabinet maker who purchases plywood and uses it to make kitchen cabinets. These

downstream manufacturers include makers of cabinets, furniture, and other manufacturers of composite wood products, as defined under the Regulations. Because these businesses would be selling products that are made out of composite wood, they would be subject to the Regulations. Compared to upstream manufacturers of composite wood products, downstream manufacturers have similar labelling requirements, no testing requirements and reduced record-keeping requirements.

As with the upstream manufacturers, most downstream manufacturers make products to sell in the United States as well as in Canada. The additional marginal costs to manufacturing associated with the Canadian proposed Regulations would therefore be negligible for these manufacturers.

For manufacturers that do not sell to the United States, the manufacturing cost increases from the Canadian proposed Regulations would be limited. The only impact on manufacturing would be that if they are not currently buying raw materials that comply with the voluntary CSA standard, they would need to start buying compliant raw materials once the Canadian Regulations are in place. The additional cost of buying compliant hardwood plywood or particleboard, compared to non-compliant products, would have a relatively small impact on overall manufacturing costs.

Regardless of whether the manufacturers sell to the United States, all Canadian manufacturers would benefit from a reduction in the imports of foreign manufactured composite wood products containing high levels of formaldehyde. As with the upstream manufacturers, the Canadian regulations would require imported products to comply with the formaldehyde Regulations, resulting in the need to shift manufacturing methods for some exporters to Canada.

Costs to importers, retailers and consumers

At present, there are composite wood products being imported into Canada that produce high levels of formaldehyde emissions. The proposed Regulations would prohibit the import of those products. Canadian companies that are currently importing composite wood products with formaldehyde emission levels higher than those that would be allowed under the proposed Regulations would need to convince their suppliers to change manufacturing methods, or else find new suppliers. This could lead to a small increase in the costs of the imports. It should be noted that the cost of manufacturing composite wood products and sending them to Canada is dominated by the cost of the wood itself, the cost of machinery, and the cost of shipping bulky items overseas. The cost of the chemicals used represents only a small fraction of the total cost. Shifting to more expensive resins and manufacturing methods is expected, therefore, to have only a small effect on the total cost of manufacturing the products and sending them to Canada.

As previously mentioned, Canada imports approximately $3.5 billion worth of manufactured wood products per year, but the domestic production of manufactured wood products is worth over $11 billion per year. A significant majority of the products currently being manufactured in Canada are believed to already comply with the proposed limits. A slight increase in costs for the small fraction of products on the shelves that are not already in compliance is expected to have a fairly small impact on retailers and consumers.

The proposed Regulations would also create record-keeping requirements for importers and retailers. These costs are also expected to be small relative to the cost of importing or selling wood products.

Cost to government for enforcement and compliance promotion

The Government of Canada would incur incremental costs associated with enforcement activities, and the development and implementation of compliance and promotion activities. The annual cost of inspections (which includes operation and maintenance, transportation and sampling costs), investigations, measures to deal with violations (including warnings, environmental protection compliance orders and injunctions) and prosecutions is estimated to be $580,513. An estimated one-time amount of $38,644 would also be required for the training of enforcement officers.

Health Canada would also dedicate approximately one full-time employee to ongoing administration of the proposed Regulations, including supporting compliance promotion activities, at an annual cost of $120,000.

Health benefits to Canadians

It is well established that exposure to formaldehyde can have a range of negative impacts on the health of exposed individuals, including irritation of the eyes, exacerbation of asthma, and increased cancer risk at high levels. The California Air Resources Board determined that one of the major sources of formaldehyde exposure is from inhalation of fumes emitted from composite wood products. By placing limits on the allowable formaldehyde emissions from composite wood products, the proposed Regulations would help protect Canadians from formaldehyde in their homes. Modelling by the National Research Council of Canada indicated that the proposed emission limits would keep levels below Health Canada's recommended exposure limits, assuming standard indoor conditions in terms of ventilation and

contribution from other formaldehyde sources in homes.

Because meeting existing formaldehyde standards and labelling requirements in Canada is voluntary, it is not known how many composite wood products are currently being sold in Canada that would not comply with the proposed Regulations. However, testing by the National Research Council of Canada shows that at least some of the products currently being sold to Canadians give off formaldehyde emissions in excess of what the proposed Regulations would allow. In addition, it has been suggested that adoption of the U.S. EPA rule in the United States could lead to foreign producers and manufacturers of high formaldehyde emitting products starting to sell more of those products in Canada, if Canada were not to adopt similar requirements to the United States. By helping to protect against current formaldehyde exposure, as well as potentially higher future levels, these proposed Regulations are expected to contribute to the protection of human health by improving indoor air quality.

Regarding the impact on asthma in particular, as already mentioned, formaldehyde exposure is known to cause irritation of the eyes, nose, and throat and to worsen asthma symptoms, particularly among children. As of 2014, there are approximately 3 million Canadians who suffer from asthma, including approximately 600 000 children. footnote 11, footnote 12, footnote 13, footnote 14, footnote 15

It is estimated that 239 Canadians died because of their asthma in 2010. footnote 16 In 2017, about 55 000 Canadians visited emergency rooms because of asthma symptoms. Among children under four years of age, there are approximately 180 hospitalizations due to asthma for every 100 000 children. footnote 17 The most serious health risks associated with asthma, including hospitalization and emergency room visits, are significantly more common in children from lower income households, with children from the lowest income neighbourhoods being 50% to 60% more likely than children from the highest income neighbourhoods to be admitted to hospital for asthma-related problems. footnote 18 Of note, lower-income households are also the households most likely to have furniture made from inexpensive composite wood products that may have higher formaldehyde emissions.

In addition to the health risks of low-level exposure, particularly high levels of exposure to formaldehyde are known to cause cancer of the nasal passageways. In 2013, there were 360 new cases of nasal cancer diagnosed among Canadians and 80 Canadians died from nasal cancer. footnote 19 The losses in socio-economic welfare associated with nasal cancer are valued at over $600 million per year.footnote 20

It is not possible to estimate the reduction in formaldehyde exposure or the reduction in nose or throat irritation, asthma episodes, hospitalizations or in the risks of nasal cancer. However, even a small reduction in these health risks, which are known to be associated with formaldehyde exposure, could provide health benefits for Canadians.

Overall expected impacts of the proposed Regulations

The reduction of formaldehyde exposure to Canadian consumers resulting from the proposed Regulations is expected to be accompanied by slightly higher prices for certain products. However, the reduced formaldehyde exposure is expected to lead to important improvements in indoor air quality, which contributes to health benefits such as less frequent asthma and allergy symptoms, lower risk of serious complications from asthma, and lower cancer risk.

Sex and gender analysis

These Regulations are not expected to have any negative impacts on particular groups of Canadians on the basis of sex, gender, race, or ethnicity.

Significantly more men than women are currently employed in the manufacturing of composite wood products in Canada. Many of the employees in this sector live in rural communities, and Indigenous Canadians are more highly represented in this sector than they are in many other manufacturing industries. Canadian manufacturers have been largely supportive of these Regulations, so it is not expected there would be any negative employment impacts in the sector.

Canadian importers may assume some costs under the proposed Regulations, but those costs are not expected to be large enough to result in significant job losses. A breakdown of importers by sex, gender, or race is not available, but since retail sales are fairly evenly spread across sex, gender, and race, it is expected that these proposed Regulations would not put a significant strain on importers or retailers on the basis of their sex, gender, or race.

Reducing formaldehyde levels in Canadian homes would be good for the health of all Canadians. Lower income Canadians in particular are expected to benefit from the proposed Regulations because they are more likely to buy inexpensive furniture or flooring made of composite wood, which may have higher emissions of formaldehyde. Further, since children are particularly susceptible to some of the health risks associated with formaldehyde exposure, these proposed Regulations would be particularly beneficial for Canadian children and their parents. The health benefits would be the greatest for low-income households with a large number of children.

"One-for-One" Rule

The proposed Regulations are expected to result in an increase in administrative burden; therefore, the proposal is considered an "IN" under the Rule. It is estimated that the proposed Regulations would result in $346,010 (2012 Can$) in new administrative costs for Canadian businesses.[footnote 21]

These new costs would require equal and offsetting administrative cost reductions to existing regulations, and as these are new regulations, Health Canada would also be required to repeal at least one existing regulation within two years. The resulting annualized IN, as calculated using the prescribed methodology in the *Red Tape Reduction Regulations*, would be $28,672.

Impacted companies

The testing and record-keeping requirements under the proposed Regulations are most significant for those companies that are involved in various stages of the manufacturing of composite wood products. This includes manufacturers of panels and laminated products. It is estimated that there are 580 companies in Canada involved in various stages of the manufacturing of composite wood products. It is estimated that almost all of these companies make products that they would want to be able to sell in the United States. For these companies, the incremental administrative costs associated with complying with the Canadian proposed Regulations, on top of what they would already be required to do to comply with the U.S. rule, would likely be small. It is assumed that there would only be about 20 companies involved in the manufacturing of composite wood products using high levels of formaldehyde that would not plan to sell products in the United States in the future. For those companies, the administrative costs associated with the Canadian proposed Regulations would be much larger.

There are approximately 2 100 companies that are involved in the import, retail, and wholesale of composite wood products. If they are not manufacturing any composite wood products themselves using formaldehyde, the administrative costs for these companies would be minor compared to costs for the manufacturers that are responsible for more extensive testing, labelling, record keeping, and reporting.

Administrative costs related to testing, record keeping, and reporting

Most manufacturers also sell their products in the United States. The U.S. record-keeping and reporting requirements are similar to the Canadian record-keeping and reporting requirements, so in most cases the same records and reports would satisfy both regulations. The incremental record-keeping requirements for compliance with the Canadian proposed Regulations would consist of filling out any unique paperwork required under the Canadian Regulations, providing the annual report to the Canadian Government, and providing records to the Government upon request. It is estimated that for an average company, this would require approximately 3 hours of work every quarter, or 12 hours of work per year. Assuming an average wage rate of $30, this would result in administrative costs of $360 per company per year. Multiplying by 560 companies leads to annual costs of $201,600.

The Canadian proposed Regulations require record keeping for a longer period of time than do the U.S. regulations, but it is assumed that once the records are on file, the incremental cost to keep those records for five years, instead of three, is insignificant.

For manufacturers that have no intention of selling their products in the United States, the Canadian Regulations would result in considerable new administrative requirements regarding the generation and maintenance of records. The actual costs of having tests done are not part of the administrative costs, but the paperwork surrounding that testing is an administrative cost. It is estimated that the paperwork required to arrange, keep track of, and report on product tests would require about 15 hours of work per quarter, or 60 hours per year. Assuming a $30 wage rate, this would be an annual cost of $1,800 per company. Assuming 20 companies fall into this category, annual costs for these companies together would be $36,000 per year.

In addition, it is assumed that for companies that would not otherwise comply with the U.S. regulation, there would be a one-time cost of $300 (10 hours of work) in order to familiarize themselves with the requirements of the Canadian proposed Regulations. That would be a total up front cost of $6,000 for these companies.

Record-keeping requirements for importers and retailers is significantly less involved than for manufacturers. The main requirement for this group is that members keep records on where their products came from. It is expected that this is something most retailers already do. If required to produce those records for the Minister of the Environment, then there would be an administrative cost of doing so. Under compliance and enforcement activities, it is expected that enforcement officers and/or government officials may request to view 50 to 200 records each year from retailers or importers, following an inspection protocol. When so requested, it is expected that producing these records would take about half an hour of work. Assuming an average wage rate of $30 and taking the high-end estimate of 200 requests per year would result in annual administrative costs of $3,000 for companies not involved in manufacturing of wood products using formaldehyde.

Small business lens

The proposed Regulations would not impose significant or disproportionate costs on small businesses.

There are approximately 320 small businesses in Canada that are engaged in the manufacturing of composite wood products. It is expected that a large majority of those small businesses would in general benefit from the proposed Regulations due to harmonization with U.S. regulation, and that about 20 of these businesses would carry larger compliance costs. Harmonizing the proposed Regulations with the U.S. regulatory system as much as possible would ensure that the wood products produced by Canadian businesses would be offered on both markets, while reducing the administrative burden of tracking separate regulatory systems and the costs of making multiple product lines. This could be advantageous for Canadian small businesses that would likely not be able to make multiple product lines, and for whom administrative costs can be particularly onerous.

Outside of the composite wood manufacturing sectors, there may be impacts on small business importers, but these impacts are expected to be minor.

Consultation

On March 18, 2017, the Government published a notice of intent (NOI) in the *Canada Gazette*, Part I, to develop regulations respecting formaldehyde in composite wood products. Six comments on the NOI were received from two industry associations, three non-governmental organizations (NGOs), and one federal Crown corporation.

In April 2017, two separate webinar series were presented to stakeholders in English and French, detailing the Government of Canada's intent to regulate formaldehyde emissions from composite wood products. These webinars were attended by four large industry associations representing manufacturers of composite wood products, as well as an emission testing laboratory, 11 major retailers, and a chemical manufacturer.

The webinars also provided an overview of a voluntary information-gathering questionnaire that was sent out and used to solicit feedback on the proposed regulatory approach from interested stakeholders. Among other information solicited, the questionnaire asked about current manufacturing methods and whether existing composite wood products were compliant with existing requirements such as California's CARB requirement or the proposed TSCA rule, at the time. Completed questionnaires were returned by one retailer, one laminated product manufacturer, and four panel manufacturers.

In July 2017, a consultation document was published and further public comments were received from six industry associations, three health and environmental NGOs, one national accreditation board, and one international trade organization.

In September 2017, a stakeholder workshop was hosted by the Government to review the proposed regulatory approach. This workshop was attended by six panel manufacturers, a laminated product manufacturer, six composite wood product manufacturers, seven emission testing laboratories, two retailers, a chemical manufacturer, and an Indigenous peoples representative. The workshop was also attended by 20 associations representing downstream and/or upstream industry sectors that may be affected by the proposed Regulations.

Other consultation activities included a seminar with the First Nations National Building Officers Association to inform officials of the rationale for the proposed Regulations and of the manner in which to recognize compliance labels. Health Canada also participated as a panellist at the March 2018 International Wood Products Association Conference in New Orleans, Louisiana. The Forest Products Association of Canada, the Canadian Wood Council, the Composite Panel Association and the National Research Council of Canada are participating in an ongoing consultation via submission of voluntary information regarding technical aspects of composite wood products and emission testing, as well as of concerns shared with the U.S. EPA related to the TSCA Title VI rule.

Beginning with the initial publication of the NOI, and throughout the entire consultation process for the proposed Regulations, there has been very strong support for these Regulations from all stakeholders involved in the consultations. Health and environmental NGOs have expressed strong support for the health objectives of the proposed Regulations. Industry associations, as well as many individual companies, have expressed strong support for a Canadian regulation aligned with the U.S. EPA rule. These associations and companies have stressed the need for a Canadian regulation that is aligned with that of the United States as closely as possible to ensure the same products can be sold in both markets.

Some of the other comments received throughout the consultation process focused on compliance feasibility for different products and the administrative requirements under the proposed Regulations. Many companies indicated that their products were already compliant with the EPA emission standard and that compliance was achievable at reasonable costs with minimal impacts on product quality for most products. It was suggested that compliance may not be possible for all types of composite wood products and a number of comments were made related to potential exclusions, exemptions, or extended

compliance timelines for certain products. The need for very clearly defined definitions of products was highlighted, including the need to differentiate based on “consumer” products. Third-party certification, labelling requirements, inspection requirements, and the use of existing stockpiles once the Regulations come into effect were all raised as issues of potential concern. NGOs and some industry members also suggested moving to progressively lower levels of allowable formaldehyde emissions. The need to move quickly to keep up with the United States was raised by both industry and NGOs.

All of the comments received were taken into consideration when developing the proposed Regulations. Where possible, the regulatory requirements have been designed to align with the U.S. rule as much as possible, while still ensuring that health objectives are met. The formaldehyde emission limits proposed in the Regulations, and the products to which they would apply, are consistent with those of the U.S. rule. Other comments have also been taken into consideration and adopted where possible in the development of the proposed Regulations.

Rationale

Given the health problems associated with formaldehyde exposure, and composite wood products being a major contributing source of formaldehyde exposure in homes, a regulation to limit the potential exposure of Canadians to formaldehyde from this source would have significant health benefits.

By aligning emission limits and requirements as much as possible with those of the United States, the costs to Canadian companies would be greatly reduced, and the level playing field for Canadian, American, and international companies would provide economic benefits for Canadian companies. The incorporation by reference of well-established technical standards developed by expert domestic and international agencies would allow for consistent understanding and application of the Regulations. When better or more efficient testing methods become available, or when testing accreditation requirements change, the standards can be reviewed and updated by the agencies. Because of the manner in which the standards would be incorporated by reference into the Regulations, updates to the standards would automatically update the regulatory requirements, without the need to rewrite the regulatory text. This would allow the Regulations to remain relevant, consistent with the current industry standards and best practices, and allow the Regulations to adapt to technological change and innovation. The Government of Canada would monitor changes in these standards over time and, in some cases, participate in the review of these standards to help ensure the published standards remain consistent with the health objectives of the Regulations.

The internally generated document, which is incorporated by reference in the Regulations, may also be updated, such as during technological advancement. This would allow the regulatory requirements to be revised without having to add technical concepts into the Regulations themselves.

The Government would also develop guidance documents, where necessary, to facilitate regulatees’ understanding of the published standards and how those standards are reflected in the Regulations.

In accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*, a strategic environmental assessment (SEA) was completed under Canada’s Chemical Management Plan (CMP). The detailed analysis that was completed as part of the SEA indicated that the CMP would have a positive effect on the environment and human health.[footnote 22]

Implementation, enforcement and service standards

Once the proposed Regulations come into force, the Government of Canada would carry out compliance promotion activities, including continued engagement with existing stakeholders, engagement with any newly identified stakeholders, the creation of guidance materials, and the posting of information on the Government websites.

Enforcement

These proposed Regulations would be made under CEPA. Enforcement officers would, when verifying compliance with the Regulations, apply the Compliance and Enforcement Policy for CEPA. This Policy sets out the range of possible responses to alleged violations, including warnings, directions in the event of releases, environmental protection compliance orders, tickets, ministerial orders, injunctions, prosecution and environmental protection alternative measures, which are an alternative to a court prosecution after the laying of charges for a CEPA violation. In addition, the Policy explains when the Government of Canada will resort to civil suits by the Crown for cost recovery.

To verify compliance, enforcement officers may carry out an inspection. An inspection may identify an alleged violation, and alleged violations may also be identified by Government of Canada technical personnel or through complaints received from the public. Whenever a possible violation of the Regulations is identified, enforcement officers may carry out investigations.

Performance measurement and monitoring

The Government of Canada would monitor compliance and assess performance with the Regulations over time with data collected through reports and enforcement activities (e.g. assessing formaldehyde emission levels/trends from composite wood products and compliance rates). It is expected that over time, regulatory violations would become less frequent, and formaldehyde emission levels from composite wood products sold in Canada would decrease.

If the Regulations are approved, once they have been in place for five years, the Government will assess regulatory performance and will, if appropriate, re-evaluate the design of the Regulations and/or the Government's compliance and enforcement activities.

Contact

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PROPOSED REGULATORY TEXT

Notice is given, pursuant to subsection 332(1) footnote a of the *Canadian Environmental Protection Act, 1999* footnote b, that the Governor in Council, on the recommendation of the Minister of the Environment and the Minister of Health, pursuant to subsection 93(1) of that Act, proposes to make the annexed *Formaldehyde Emissions from Composite Wood Products Regulations*.

Any person may, within 75 days after the date of publication of this notice, file with the Minister of the Environment comments with respect to the proposed Regulations or, within 60 days after the publication of this notice, file with that Minister a notice of objection requesting that a board of review be established under section 333 of that Act and stating the reasons for the objection. All comments and notices must cite the *Canada Gazette*, Part I, and the date of publication of this notice, and be addressed to the Director, Forest Products and Fisheries Act, Environmental Protection Branch, Department of the Environment, Place Vincent Massey, 351 Saint-Joseph Boulevard, 19th floor, Gatineau, Quebec K1A 0H3 (email: eccc.substances.eccc@canada.ca).

A person who provides the information to the Minister of the Environment may submit with the information a request for confidentiality under section 313 of that Act.

Ottawa, June 13, 2019

Julie Adair
Assistant Clerk of the Privy Council

Formaldehyde Emissions from Composite Wood Products Regulations

Interpretation

Definitions

1 The following definitions apply in these Regulations.

- ***ASTM D6007*** means ASTM International standard D6007 entitled *Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber*. (*ASTM D6007*)
- ***ASTM E1333*** means ASTM International standard E1333 entitled *Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber*. (*ASTM E1333*)
- ***Directive*** means the document entitled *Directive Concerning Testing for Formaldehyde Emissions*, published by the Government of Canada on its website on June 28, 2019. (*directive*)
- ***composite wood panel*** means any of the following products:
  - **(a)** hardwood plywood;
  - **(b)** particleboard;
  - **(c)** medium-density fibreboard;
  - **(d)** thin medium-density fibreboard; or
  - **(e)** core or platform of a laminated product consisting of any of the products set out in

paragraphs (a) to (d). (*panneau de bois composite*)

- ***composite wood product*** means a composite wood panel, a laminated product or any component part or finished good that incorporates a composite wood panel or a laminated product. (*produit de bois composite*)
- ***hardboard*** means a panel composed of cellulosic fibre, consolidated under heat and pressure in a hot press by one of the following processes:
  - **(a)** a wet process;
  - **(b)** a dry process that uses phenolic resin or a resin in which there is no formaldehyde as part of the resin cross-linking structure; or
  - **(c)** a wet-formed and dry-pressed process. (*panneau dur*)
- ***hardwood plywood*** means a panel made from plies of veneer of hardwood, softwood or a woody grass species that are glued together or to a platform consisting of a composite core, specialty cores or special back material. (*contreplaqué de feuillus*)
- ***laminated product*** means a product in which a wood or woody grass veneer is glued to a composite wood panel or to a veneer core or platform. (*produit lamellé*)
- ***medium-density fibreboard*** means a panel composed of cellulosic fibres made by dry forming and pressing on a resinated fibre mat but excludes hardboard. (*panneau de fibres à densité moyenne*)
- ***particleboard*** means a panel composed of discrete particles of cellulosic material pressed together with resin but excludes a panel made from fibres, flakes or strands. (*panneau de particules*)
- ***thin medium-density fibreboard*** means medium-density fibreboard that has a maximum thickness of 8 mm. (*panneau de fibre à densité moyenne mince*)

Ambulatory incorporation by reference

2 Unless otherwise indicated in these Regulations, any reference to a standard that is incorporated by reference is a reference to that standard as amended from time to time.

Application

Application

3 Subject to section 4, these Regulations apply in respect of any composite wood product that emits formaldehyde and that is for indoor use.

Non-application

4 These Regulations do not apply in respect of the following:

- **(a)** curved plywood;
- **(b)** finger-jointed lumber;
- **(c)** the following structural wood products in which moisture-resistant adhesives are used:
  - **(i)** structural plywood that complies with sections 6 to 7.2.4 of the Canadian Standards Association standard CAN/CSA-O121 entitled *Douglas fir plywood* or with section 5 of the National Institute of Standards and Technology Standard NIST PS 1 entitled *Voluntary Product Standard PS 1 Structural Plywood*,
  - **(ii)** oriented strand board and structural panels that comply with section 5 and Appendix GA of the Canadian Standards Association standard CAN/CSA-O325 entitled *Construction sheathing* and sections 5.2 to 5.4 of the National Institute of Standards and Technology Standard NIST PS 2 entitled *Voluntary Product Standard PS 2 Performance Standard for Wood-Based Structural-Use Panels*,
  - **(iii)** structural composite lumber that complies with sections 4.3 and 6.4 to 6.10.2 of the ASTM International standard D5456 entitled *Standard Specification for Evaluation of Structural Composite Lumber Products*,
  - **(iv)** structural glued-laminated timber that complies with sections 5.1, 5.3, 6.1 to 6.8.1 and 7 of the Canadian Standards Association Standard CAN/CSA-O122 entitled *Structural glued-laminated timber*,
  - **(v)** wood I-joists that comply with sections 5 and 6.2 to 6.6.3 of the ASTM International Standard D5055 entitled *Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists*, and
  - **(vi)** cross-laminated timber that complies with sections 5, 6, 7.2 to 7.2.1, 8.2, 8.3, 8.5 to 8.5.6.2 and 9.3 of the American National Standards Institute Standard ANSI/APA PRG 320 entitled *Standard for Performance-Rated Cross-Laminated Timber*;
- **(d)** hardboard;
- **(e)** spools and wood packaging, including pallets, crates, and dunnage;
- **(f)** composite wood products used in
  - **(i)** a vehicle other than a mobile home, motor home or recreational trailer,
  - **(ii)** any car or railway equipment that is designed for movement on its wheels on the rails of a railway,
  - **(iii)** a vessel, or
  - **(iv)** an aircraft;

- **(g)** windows that contain a composite wood product that represents less than 5% of the total volume of the window, including the glass;
- **(h)** exterior or garage doors that contain a composite wood product that either represents less than 3% of the total volume of the exterior or garage door or that contain a composite wood product made only with a no-added formaldehyde resin or an ultra low-emitting formaldehyde resin;
- **(i)** composite wood products that are to be used for research and development activities;
- **(j)** composite wood products that are to be used in a laboratory for analysis, in scientific research or as a laboratory analytical standard; and
- **(k)** composite wood products that are manufactured or imported for export only.

Prohibitions

Import

5 A person must not import a composite wood product unless the emission of formaldehyde from that product, when tested in accordance with these Regulations, does not exceed the limits set out in section 7.

Sell or offer for sale

6 A person must not sell or offer for sale a composite wood product unless the emission of formaldehyde from that product, when tested in accordance with these Regulations, does not exceed the limits set out in section 7.

Formaldehyde Emission Limits

Composite wood panel and laminated product — limits

7 (1) The emission of formaldehyde from a composite wood panel or laminated product, other than one referred to in section 8 or 9, must not exceed the following limits when testing for emissions in accordance with subsections 10(1) and (2) or when testing for quality control in accordance with paragraphs 12(1)(a) or (b) and subsection 12(2):

- **(a)** for hardwood plywood, 0.05 p.p.m.;
- **(b)** for particleboard, 0.09 p.p.m.;
- **(c)** for medium-density fibreboard, 0.11 p.p.m.;
- **(d)** for thin medium-density fibreboard, 0.13 p.p.m.; and
- **(e)** for laminated products, 0.05 p.p.m.

Test method set out in paragraph 12(1)c) — limit

(2) The emission of formaldehyde from a composite wood panel or laminated product, other than one referred to in section 8 or 9, must not exceed the quality control limit set out in section 3.2 of the Directive when testing for quality control in accordance with paragraph 12(1)(c) and subsection 12(2).

No-added formaldehyde resin — limits

8 (1) The emission of formaldehyde from a composite wood panel or laminated product in which a no-added formaldehyde resin is used must not exceed the following limits when testing for emissions or quality control in accordance with section 13:

- **(a)** for hardwood plywood or laminated product, 0.05 p.p.m.; and
- **(b)** for particleboard, medium-density fibreboard and thin medium-density fibreboard, 0.06 p.p.m.

Additional limit — quality control

(2) The emission of formaldehyde from a panel or product referred to in subsection (1) must not exceed 0.04 p.p.m for 90% of the results of the three consecutive months of quality control testing.

Ultra low-emitting formaldehyde resin — limits

9 (1) The emission of formaldehyde from a composite wood panel or laminated product in which an ultra low-emitting formaldehyde resin is used must not exceed the following limits when testing for emissions or quality control in accordance with section 16:

- **(a)** for hardwood plywood or laminated product, 0.05 p.p.m.;
- **(b)** for particleboard, 0.08 p.p.m.;
- **(c)** for medium-density fibreboard, 0.09 p.p.m.; and
- **(d)** for thin medium-density fibreboard, 0.11 p.p.m.

Additional limits — quality control

(2) The emission of formaldehyde from a panel or product referred to in subsection (1) must not exceed

the following limits for 90% of the results of the six consecutive months of quality control testing:

- **(a)** 0.05 p.p.m. for particleboard;
- **(b)** 0.06 p.p.m. for medium-density fibreboard; and
- **(c)** 0.08 p.p.m. for thin medium-density fibreboard.

Other applicable limits

(3) The emission of formaldehyde from a panel or product referred to in subsection (1) must not exceed the following limits when testing in accordance with section 16:

- **(a)** for formaldehyde emissions or quality control:
  - **(i)** 0.05 p.p.m. for hardwood plywood or a laminated product, and
  - **(ii)** 0.06 p.p.m. for particleboard, medium-density fibreboard or thin medium-density fibreboard; and
- **(b)** for quality control, 0.04 p.p.m. for 90% of the six consecutive months of emissions testing.

Testing

General Provisions

Emission testing — composite wood panel and laminated product

10 (1) A manufacturer must have a specimen of a composite wood panel or laminated product tested by an accredited laboratory in accordance with the requirements set out in ASTM E1333 or, if equivalence is established in accordance with subsection (3), ASTM D6007.

Frequency

(2) Subject to sections 13 to 15 and 16 to 19, the testing must be conducted four times annually, at the following intervals to ensure that the formaldehyde emission limits set out in subsection 7(1) are met:

- **(a)** once between January and March;
- **(b)** once between April and June;
- **(c)** once between July and September; and
- **(d)** once between October and December.

Equivalence of testing methods

(3) For the purposes of subsection (1), the manufacturer who decides to test the specimen in accordance with the requirements set out in ASTM D6007 must establish the equivalence of ASTM D6007 to ASTM E1333 in the manner set out in section 2 of the Directive and re-establish equivalence:

- **(a)** annually for the first three consecutive years and every two years thereafter; and
- **(b)** whenever there is a change in equipment, procedure or the qualification of testing personnel in a manner that affects limits of formaldehyde emissions.

Exemption from emission testing — laminated products

11 A manufacturer of laminated products that have a core or platform whose emissions meet the limits set out in subsection 7(1) and in which a phenol-formaldehyde resin or a no-added formaldehyde resin is used is exempt from testing for emissions.

Quality control testing — composite wood panel and laminated product

12 (1) A manufacturer must test a specimen of a composite wood panel or laminated product for quality control, or have an accredited laboratory conduct this test, in accordance with the following:

- **(a)** ASTM E1333;
- **(b)** ASTM D6007, if equivalence is established in accordance with subsection 10(3); or
- **(c)** a test method that yields results that are, in accordance with subsection (6), correlated with the results obtained by using ASTM E1333 or, if equivalence is established in accordance with subsection 10(3), ASTM D6007.

Frequency

(2) Subject to sections 13 to 15 and 16 to 19, the quality control testing must be conducted at the following frequencies to ensure that the emission limits set out in section 7 are met:

- **(a)** in the case of hardwood plywood or laminated products:
  - **(i)** if the weekly amount manufactured is 9 290 m^2 or less, but more than 9 290 m^2 is manufactured each month, one test per 9 290 m^2 of the product type manufactured,

- **(ii)** if the weekly amount manufactured is less than or equal to 9 290 m^2, one test of that product type every month that it is manufactured,
- **(iii)** if the weekly amount manufactured is greater than 9 290 m^2 and less than 18 581 m^2, once a week per product type,
- **(iv)** if the weekly amount manufactured is greater or equal to 18 581 m^2 and less than 37 161 m^2, twice a week per product type, or
- **(v)** if the weekly amount manufactured is greater or equal to 37 161 m^2, four times per week per product type; and

- **(b)** in the case of particleboard, medium-density fibreboard or thin medium-density fibreboard, for each production line or product type, once every eight or twelve hours, depending on shift length, plus or minus one hour.

Exemption from quality control testing — laminated products

(3) A manufacturer of laminated products that have a core or platform whose emissions meet the limits set out in section 7 and in which a phenol-formaldehyde resin or a no-added formaldehyde resin is used is exempt from testing for quality control.

Reduced quality control testing

(4) A manufacturer of particleboard, medium-density fibreboard or thin medium-density fibreboard may conduct quality control testing once every 24- or 48-hour production period, if the requirements set out in section 3.3 of the Directive are met.

Quality control — additional testing

(5) A manufacturer must conduct a quality control test, in addition to the testing requirements set out in subsection (2), in the following circumstances:

- **(a)** there is a change in the resin composition that increases the formaldehyde to urea ratio;
- **(b)** there is an increase of more than 10% in the amount of formaldehyde resin used per square meter or per panel or laminated product;
- **(c)** there is an increase of more than 20% in the adhesive application rate;
- **(d)** there is a decrease in designated press time by more than 20%; or
- **(e)** the manufacturer believes that the limits set out in section 7 are not met.

Correlation of test results

(6) For the purposes of paragraph (1)(c), the manufacturer who decides not to use an accredited laboratory for quality control testing must establish the correlation in the manner set out in sections 4.1 and 4.2 of the Directive and re-establish correlation in the circumstances set out in section 4.3 of the Directive.

Composite Wood Panel or Laminated Product Made with a No-added Formaldehyde Resin

Frequency of testing — emission and quality control

13 Subject to section 15, in the case of a composite wood panel or laminated product in which a no-added formaldehyde resin is used, a manufacturer must conduct the following testing during a period of three consecutive months to ensure that the limits set out in section 8 are met:

- **(a)** one test for emissions in accordance with subsection 10(1); and
- **(b)** thirteen tests for quality control in accordance with subsection 12(1).

Exemption

14 Subject to section 15, a manufacturer who meets the requirements set out in section 13 is exempt from testing for a period of two years from the date on which these requirements are met.

Change in resin or process

15 A manufacturer must conduct one test for emissions in accordance with subsection 10(1) and one quality control test in accordance with subsection 12(1) whenever the resin used in the manufacture of a panel or laminated product referred to in section 13 or the manufacturing process is changed in a manner that affects limits of formaldehyde emissions.

Composite Wood Panel or Laminated Product Made with an Ultra Low-emitting Formaldehyde Resin

Frequency of testing — emission and quality control

16 Subject to section 19, in the case of a composite wood panel or laminated product in which an ultra low-emitting formaldehyde resin is used, a manufacturer must conduct the following testing, during a period of six consecutive months:

- **(a)** two tests for emissions in accordance with subsection 10(1); and
- **(b)** twenty-six tests for quality control in accordance with subsection 12(1).

Exemption — subsections 9(1) and (2) requirements

17 Subject to section 19, a manufacturer who meets the requirements set out in section 16 and whose panels and products referred to in section 9 meet the requirements set out in subsections 9(1) and (2) is exempt from testing for emissions for a period of six months and from quality control testing for a period of two years from the date on which these requirements are met.

Exemption — subsection 9(3) requirements

18 Subject to section 19, a manufacturer who meets the requirements set out in section 16 and whose panels and products referred to in section 9 meet the requirements set out in subsection 9(3) is exempt from testing for a period of two years from the date on which these requirements are met.

Change in resin or process

19 A manufacturer must conduct one emissions test in accordance with subsection 10(1) and thirteen quality control tests in accordance with subsection 12(1) whenever the resin used in the manufacture of the panel or product referred to in section 16 or the manufacturing process is changed in a manner that affects limits of formaldehyde emissions.

Specimens

Selection

20 (1) A manufacturer must select a specimen of a composite wood panel or laminated product from a bundle, but not from the top or bottom panel or product of a bundle.

Composite wood panel

(2) The specimen of the composite wood panel must be in an unfinished condition and without a topcoat.

Stacking or wrapping

(3) The specimen must be dead-stacked or wrapped airtight between the time of sample selection and the start of test conditioning.

Handling of specimen

21 The specimen must be handled in accordance with the requirements set out in section 9.1 of ASTM D6007.

Shipping of specimen

22 During shipment of the specimen, the following conditions must be met:

- **(a)** the specimen must be shipped in accordance with the requirements set out in section 9.1 of ASTM E1333; and
- **(b)** any packaging that is used to contain the specimen, must be suitable so that the specimen will not be punctured or otherwise damaged during shipment and must not be made of materials that could contaminate the specimen.

Traceability of specimens

23 Every person who handles the specimen must record the details in a document that accompanies the specimen when it moves between facilities, including facilities between the same organization.

Inspection of a sample packaging

24 (1) As soon as practical after a specimen arrives at an accredited laboratory, the person responsible for the specimen must inspect the packaging for signs of damage and must note its condition.

Packaging unopened

(2) The packaging must not be opened until specimen conditioning occurs.

Rejection of test specimen

(3) A person responsible for the test specimen must reject it if

- **(a)** the information in the document that accompanies the specimen is missing or incomplete;
- **(b)** the packaging used to ship the specimen is damaged;
- **(c)** the specimen is damaged or contaminated; or
- **(d)** testing of the specimen cannot be initiated within the time limit prescribed by subsection (5).

Specimen conditioning

(4) The manufacturer or the person responsible for the specimen, as the case may be, must condition the specimen in accordance with the requirements of ASTM E1333 or ASTM D6007 within 30 days after the composite wood panel or laminated product is manufactured.

Time limit for testing

(5) The manufacturer or the person responsible for the specimen, as the case may be, must test the specimen within 30 days after the composite wood panel or laminated product is manufactured.

Chamber conditions for testing

25 A manufacturer or accredited laboratory who conducts the testing referred to in subsections 10(1) and (2) and paragraphs 12(1)(a) and (b) must do so in accordance with the applicable formaldehyde chamber conditions set out in Table 1 of the Directive.

Test chamber operation

26 A manufacturer or accredited laboratory must operate the chambers used for the testing referred to in subsections 10(1) and (2) and paragraphs 12(1)(a) and (b) in accordance with the requirements of ASTM E1333 or ASTM D6007.

Non-compliant lot

Non-compliant lot

27 (1) A composite wood panel or laminated product is considered part of a non-compliant lot if

- **(a)** one emission test, in accordance with subsection 10(1), exceeds the limits set out in subsection 7(1);
- **(b)** one quality control test, in accordance with paragraphs 12(1)(a) or (b), exceeds the limits set out in subsection 7(1); or
- **(c)** three consecutive quality control tests, in accordance with paragraph 12(1)(c), exceed the limit set out in subsection 7(2).

Notice

(2) A manufacturer or, if the manufacturer carries on business outside Canada, the importer who has sold a panel or a product from a non-compliant lot must notify the Minister in writing and any person to whom the panel or product is sold, within two days after the day on which they become aware of the non-compliance.

Upon receipt of notice

(3) A person to whom the panel or product is sold who receives the notice must send a copy of it two days after receipt of the notice to any person to whom they have sold the panel or product.

Accredited Laboratory

Accredited laboratory

28 Any testing to determine the presence of formaldehyde emissions from a composite wood panel or laminated product for the purposes of these Regulations must be performed by a laboratory that meets the following conditions at the time of testing:

- **(a)** it is accredited
  - **(i)** under the International Organization for Standardization standard ISO/IEC 17025 entitled *General requirements for the competence of testing and calibration laboratories* by an accrediting body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement, or
  - **(ii)** under the *Environment Quality Act*, CQLR, c. Q-2; and
- **(b)** the scope of the laboratory's accreditation includes the testing to determine the presence of formaldehyde emissions from a composite wood panel or laminated product.

Labelling

Composite wood product — information

29 (1) Subject to subsections (2) and (3), the label of a composite wood product, at the time of sale in Canada, must contain the following information:

- **(a)** the name of the manufacturer;
- **(b)** the lot number; and
- **(c)** with respect to a composite wood panel or laminated product, one of the following statements:
  - **(i)** "low-emitting formaldehyde", if the product meets the emission limits set out in section 7,
  - **(ii)** "no-added formaldehyde", if the product meets the emission limits set out in section 8, or
  - **(iii)** "ultra low-emitting formaldehyde", if the product meets the emission limits set out in section 9.

Volume of not more than 929 cm^2

(2) A composite wood product that is equal to or less than 929 cm^2 does not require a label.

Volume of more than 929 cm^2

(3) A composite wood product that is more than 929 cm^2 does not require a label if its packaging or the bundle that contains the product is labelled.

Product within a bundle

(4) A composite wood product within a bundle does not require a label if the information set out in subsection (1) is reasonably ascertainable by a purchaser or the information is provided to them by the seller upon request.

Copy

(5) If a label is not affixed to the composite wood product within a bundle, the manufacturer of the component part or finished good, the importer and the retailer must retain a copy of the label, be able to identify the product associated with the label and provide the label information to any person upon request.

Form of the label

30 The label on the composite wood product may be in the form of a stamp, tag or sticker that is securely affixed to the product in a visible location in a manner that it cannot be easily removed.

Label appearance

31 (1) The label information on the composite wood product must

- **(a)** appear in both English and French; and
- **(b)** be set out in a manner that is clear and legible and printed in characters that meet the following requirements:
  - **(i)** they are of a colour that contrasts sharply with the background,
  - **(ii)** they are of a font size of at least 10 points and at least 3 mm in height,
  - **(iii)** they are enclosed by a border,
  - **(iv)** they are easily distinguishable from other graphic material on the product or its package, and
  - **(v)** they are sufficiently durable to remain legible throughout the useful life of the product under normal conditions of transportation, storage, sale and use.

Record Keeping

Manufacturer — required information

32 (1) A manufacturer must maintain the following records in either English or French or a combination thereof and provide them to the Minister upon request:

- **(a)** in respect of emission tests referred to in section 10:
  - **(i)** the full name and contact information of the person conducting or overseeing the tests,
  - **(ii)** the date on which the tests occurred,
  - **(iii)** the type of composite wood panel or laminated product tested,
  - **(iv)** the lot number of the tested composite wood panel or laminated product,
  - **(v)** the test method used, and
  - **(vi)** the test results, including the data used for establishing equivalence, in accordance with

section 2 of the Directive;
- **(b)** in respect of all quality control tests:
  - **(i)** the full name and contact information of the person conducting or overseeing the tests,
  - **(ii)** the corporate name and civic address of the facility performing the tests,
  - **(iii)** the date on which the tests occurred,
  - **(iv)** the type of composite wood panel or laminated product tested,
  - **(v)** the lot number of the tested composite wood panel or laminated product,
  - **(vi)** the test method used, and
  - **(vii)** the test results, including the data used to establish correlation in accordance with section 4 of the Directive;
- **(c)** in respect of the manufacturing of a composite wood panel or laminated product:
  - **(i)** its description,
  - **(ii)** its date of manufacturing,
  - **(iii)** its corresponding lot number, and
  - **(iv)** the tracking information allowing each panel or product to be traced to a specific lot;
- **(d)** in respect of the resin used:
  - **(i)** its trade name,
  - **(ii)** the full name, civic and postal address, phone number, and email address, if any, of the supplier,
  - **(iii)** if a manufacturer uses their own resin, records demonstrating the use of that resin;
- **(e)** in respect of changes to the manufacturing of composite wood panels and laminated products:
  - **(i)** details of any increase of more than 10% in the resin used,
  - **(ii)** details of any change in resin composition that results in a higher ratio of formaldehyde, and
  - **(iii)** details of any change that may affect formaldehyde emissions;
- **(f)** in respect of a composite wood panel or laminated product in which a no-added formaldehyde or an ultra low-emitting formaldehyde resin is used:
  - **(i)** the volume of each panel or product type manufactured,
  - **(ii)** the resin trade name,
  - **(iii)** the full name, civic and postal address, telephone number and email address, if any, of the resin supplier,
  - **(iv)** records demonstrating that the panel or laminated product meets the exemption from testing requirements set out in section 14, 17 or 18,
  - **(v)** the amount of resin use reported by volume and weight, and
  - **(vi)** details of any change in resin composition;
- **(g)** in respect of particleboard, medium-density fibreboard and thin medium-density fibreboard for which reduced quality control testing has been conducted:
  - **(i)** the volume of each panel type manufactured, and
  - **(ii)** records demonstrating that the requirements set out in section 3.3 of the Directive are met;
- **(h)** in respect of the sale of a composite wood panel or laminated product:
  - **(i)** the full name, civic and postal address, telephone number and email address, if any, of the purchaser, and
  - **(ii)** the purchase order or the invoice number and the amount purchased;
- **(i)** in respect of the transporter of the composite wood panel or laminated product, the shipping invoice number;
- **(j)** in respect of the non-compliant lot, a copy of the written notice to the purchaser, in accordance with subsection 27(2); and
- **(k)** a copy of the label used, as mentioned in subsection 29(1).

Location and retention of records

(2) Subject to subsection (4), the records must be retained for a period of five years after the date on which they are made, at one of the following locations:

- **(a)** the civic address of the manufacturer's principal place of business in Canada;
- **(b)** the civic address of any other place in Canada where the records can be inspected, if the manufacturer notifies the Minister of its address or any change to it, within 30 days.

Purchaser

(3) A manufacturer of a composite wood panel or laminated product must make the records mentioned in paragraph (1)(a) available to a purchaser, upon request.

Retention period — exception

(4) A manufacturer must keep records demonstrating that the emissions from a panel or product referred to in paragraph (1)(f) or from a panel referred to in paragraph (1)(g) meet the applicable limits for as long as it manufactures the panel or product.

Manufacturer of laminated products — additional requirements

33 (1) A manufacturer of a laminated product that does not manufacture the core or platform of the

product must keep records in either English or French or a combination thereof that contain the following documents or information:

- **(a)** the laminated product core or platform purchase record;
- **(b)** the full name, civic and postal address, phone number, and email address, if any, of the supplier;
- **(c)** the full name, civic and postal address, phone number, and email address, if any of the manufacturer of the core or platform; and
- **(d)** records demonstrating that the core or platform of the laminated product meets the limits set out in section 7.

Location and retention of records

(2) The records must be retained for a period of five years after the date on which the record is made at one of the following locations:

- **(a)** the civic address of the manufacturer's principal place of business in Canada;
- **(b)** the civic address of any other place in Canada where the records can be inspected, if the manufacturer notifies the Minister of its address or any change to it, within 30 days.

Requirements for manufacturers, importers and retailers

34 (1) Manufacturers of component parts or finished goods and importers and retailers of composite wood products are required to maintain the following records, in either English or French or a combination thereof, and provide them to the Minister upon request:

- **(a)** a written statement from the supplier that the composite wood panel or laminated product meets the limits set out in section 7;
- **(b)** the full name of the manufacturer of the composite wood panel or laminated product, civic and postal address, phone number and email address, if any of their principal place of business; and
- **(c)** the date the composite wood panel or laminated product was manufactured and the corresponding lot number.

Location and retention of records

(2) The following records must be retained for a period of five years from the date of importation or sale, at one of the following locations:

- **(a)** the civic address of the manufacturer, importer or retailer's principal place of business in Canada; and
- **(b)** the civic address of any other place in Canada where the records can be inspected, if the manufacturer, importer or retailer notifies the Minister of its address or any change to it, within 30 days.

Reporting

Annual report — manufacturer

35 (1) A manufacturer of a composite wood panel or laminated product must submit an annual report to the Minister in the form and format specified by the Minister on or before March 31 of the calendar year following the year in respect of which the report is prepared.

Content

(2) The report must contain the following information or documents:

- **(a)** the full name of the manufacturers, civic and postal address and telephone number of their principal place of business and the email address, if any;
- **(b)** if applicable, the name, title, civic and postal address, telephone number and email address, if any, of a person authorized to act on the manufacturer's behalf;
- **(c)** for each facility, production line and product type, monthly data sheets per product type that contain the following:
  - **(i)** the information respecting emission tests that is referred to in paragraph 32(1)(a),
  - **(ii)** the information respecting quality control tests that is referred to in paragraph 32(1)(b), including the quality control limits set out in section 3.2 of the Directive and the quality control graph set out in section 4.1 of that document, and
  - **(iii)** the information respecting the manufacturing of a composite wood panel or laminated product referred to in paragraph 32(1)(c) and the resin used referred to in paragraph 32(1)(d);
- **(d)** the resin trade name used in the composite wood panel or laminated product and any information concerning changes to the composition of the resin, as well as:
  - **(i)** if the manufacturer makes its own resin, the type and amount of resin used by volume and weight, or
  - **(ii)** if the manufacturer purchases the resin, the contact information of the supplier and the

resin purchase records;

- **(e)** the total volume of composite wood products manufactured and sold in Canada; and
- **(f)** the full name, civic and postal address, telephone number and email address, if any, of each person in Canada to whom a composite wood product is sold.

Transitional Provisions

Composite wood product

36 A composite wood product located in Canada before the coming into force of these Regulations, may be used in manufacturing, offered for sale or sold without meeting the requirements set out in these Regulations during a period of three years after the day on which these Regulations come into force.

Laminated products

37 A laminated product, excluding the core or platform, in which a formaldehyde resin other than a phenol-formaldehyde resin or a no-added formaldehyde resin is used, is not required to meet the requirements of these Regulations during a period of five years after the day on which these Regulations come into force.

Coming into Force

38 These Regulations come into force on the 180th day after the day on which these Regulations are published in the *Canada Gazette*, Part II.

Proposed directive concerning testing for formaldehyde emissions

On this page

Section 1: Chamber conditions for testing

1.1 Test chamber operation

The test method set out in paragraph 12(1)(a) of the *Formaldehyde Emissions from Composite Wood Products Regulations* (the regulations) is referred to as the large chamber throughout this document, and the results represent a single chamber value.

The test method set out in paragraph 12(1)(b) of the regulations is referred to as the small chamber throughout this document, and the results represent the average of three tests.

The test methods referred to in paragraph 12(1)(c) of the regulations are referred to as small-scale chambers throughout this document, and the results represent the average of three tests.

1.2 Averaging of test results

The test results may be averaged when conducting testing using a small chamber or a small-scale chamber for the purposes of sections 10 and 12 of the regulations. In order to perform this averaging, a composite wood panel or laminated product is divided into three separate specimens representing evenly distributed portions of the entire panel or product. Three separate composite wood panels or laminated products are tested separately. The test results are averaged into one data point for the three composite wood panels or laminated products that those specimens represent.

Section 2: Equivalence of the large chamber and the small chamber methods

2.1 Establishing equivalence

For the purposes of subsection 10(3) of the regulations, when equivalence is established by an accredited laboratory between a small chamber and a large chamber, all small chambers can be considered to demonstrate

equivalence.

To establish equivalence of testing methods pursuant to subsection 10(3) of the regulations, at least five sample sets must be used.

2.2 Calculations for establishing equivalence

For the purposes of subsection 10(3) of the regulations, manufacturers of composite wood panels or laminated products must ensure that equivalence between the results from the large chamber and the small chamber is demonstrated within the following ranges of formaldehyde emissions, unless they only manufacture panels or products in the lower range:

- from 0 to 0.05 parts per million
- from greater than 0.05 to 0.15 parts per million

A minimum of five specimens in each of the above formaldehyde concentration ranges must be tested using the large chamber and small chamber methods. This must represent a minimum of ten comparison specimen sets. If the manufacturer only manufactures composite wood panels or laminated products in the lower emission range, equivalence may be demonstrated only in that one emission range. The manufacturer is then restricted to only manufacturing panels or products within that one emission range.

For the large chamber method, each comparison sample must consist of the result of testing composite wood panels or laminated products, using the applicable loading factor specified in Table 1 of this document, from similar composite wood panels or laminated products of the same product type tested by the small chamber method.

For the small chamber method, each comparison sample must consist of testing specimens representing portions of composite wood panels or laminated products using Q/A ratio specified in Table 1 of this document from similar composite wood panels or laminated products tested using the large chamber method.

Arithmetic mean, 'X' and the standard deviation, 'S', of the difference of all paired results from the large and small chambers, must be calculated:

$$\overline{X} = \sum_{i=1}^{n} D_i / n$$

▶ Long description for equation 1

$$S = \sqrt{\sum_{i=1}^{n} \left(D_i - \overline{X}\right)^2 / (n-1)}$$

▶ Long description of equation 2

where:

"n" is equal to the number of paired results,

"D_i" is the difference between the results from the large chamber and small chamber methods, for the n^{th} data set, where *"i"* ranges from 1 to *"n"*.

The small chamber method is considered equivalent to the large chamber method if the following formula applies:

$$\overline{X} + 0.88S \leq C$$

▶ Long description of equation 3

where:

"C" is less or equal to 0.026 for the low-emitting range of composite wood panels or laminated products set out in (i); and

"C" is less than or equal to 0.038 for the high-emitting range of composite wood panels or laminated products, set out in (ii).

Section 3: Quality control testing

3.1 Quality control test methods

When correlation has been established pursuant to subsection 12(6) of the regulations, the correlation can be considered demonstrated for all of the small-scale chambers within the same testing facility that use the same test method and are of a similar size and construction.

3.2 Quality control limit

For each test method used to perform the quality control testing set out in paragraph 12(1)(c) of the regulations, a manufacturer of composite wood panels or laminated products must establish a quality control limit (QCL) in consultation with an accredited laboratory. The QCL is the emission value for any chamber used for quality control testing in accordance with paragraph 12(1)(c) of the regulations, which is the correlative equivalent to the applicable limits set out in subsection 7(1) of the regulations based on the large chamber method. The QCL must be below the applicable limits set out in subsection 7(1) of the regulations.

The QCL is established by using a linear regression where the variables on the Y-axis are the results from the chamber that will be used for quality control testing, and the variables on the X-axis are the results from the large chamber. This linear regression is used to predict the point where the test method used for quality control testing generates results that are representative of the applicable limits set out in subsection 7(1) of the regulations when using the large chamber method.

3.3 Reduced quality control testing for particleboard, medium-density fibreboard, and thin medium-density fibreboard

For the purposes of subsection 12(4) of the regulations, the manufacturer must maintain a 30 panel running average consisting of the average of the results of the 30 most recently sampled composite wood panels or laminated products.

The quality control testing for particleboard, medium-density fibreboard, or thin medium-density fibreboard may be reduced to one quality control test per 24-hour manufacturing period if the 30 panel running average remains two standard deviations below the designated QCL for the previous 60 consecutive calendar days or more.

The quality control testing for particleboard, medium-density fibreboard or thin medium-density fibreboard may be reduced to one quality control test per 48-hour manufacturing period if the 30 panel running average remains three standard deviations below the designated QCL for the previous 60 consecutive calendar days or more.

Section 4: Correlation of quality control testing methods

4.1 Requirements to establish correlation

For the purposes of subsection 12(6) of the regulations, correlation must be demonstrated at the outset of testing for a minimum of five sample sets. The manufacturer must work with an accredited laboratory to establish a quality control graph. The test results from the method used for quality control testing that is generated by the manufacturer is plotted on the Y-axis the emission test results from the large chamber or small chamber generated by an accredited laboratory is plotted on the X-axis.

4.2 Method of establishing correlation

For the purposes of subsection 12(6) of the regulations, the correlation is the Pearson Product Moment Correlation.

The minimum correlation coefficients are set out in Table 2 of this document, where:

- *'n'* is equal to the number of paired data sets from the quality control test method and the large chamber or small chamber
- *'r'* is the correlation coefficient

4.3 Circumstances when correlation must be re-established

For the purposes of subsection 12(6) of the regulations, a manufacturer of composite wood panels or laminated products must work with an accredited laboratory re-establish correlation if:

- two consecutive emission tests in accordance with subsection 10(1) do not meet the emission limits set out in subsection 7(1) of the regulations, for the same product type
- an emission test result generated in accordance with subsection 10(1) is compared to the quality control test result generated in accordance with paragraph 12(1)(c) and does not fit the correlation established at the outset of testing
- there is a change in equipment, procedure or the qualification of testing personnel in a manner that affects limits of formaldehyde emissions

Section 5: Tables

Table 1: Formaldehyde chamber conditions

Test method	Chamber type/size (m^3)	Length of time for conditioning	Temperature for conditioning	Relative humidity for conditioning	Loading ratio (m^2/m^3)	Temperature for test procedure	Relative humidity for test procedure

Test method	Chamber type/size (m^3)	Length of time for conditioning	Temperature for conditioning	Relative humidity for conditioning	Loading ratio (m^2/m^3)	Temperature for test procedure	Relative humidity for test procedure
Large chamber	≥22 m^3	7 days ± 3 h	24 °C ± 3 °C	50% ± 5%	0.43 hardwood plywood & particleboard 0.26 medium-density fibreboard & thin medium-density fibreboard	25 °C ± 1 °C	50% ± 4%
Small chamber	0.02 to 1.0 m^3	7 days ± 3 h for emission testing 2 hours ± 15 minutes, or up to 7 days ± 3 h for quality control testing	24 °C ± 3 °C	50% ± 5%	See Q/A ratio	25 °C ± 1 °C	50% ± 4%

* Q/A ratio (m^3/h air per m^2 test area). Q/A ratio is the area-specific flow rate, m/h. It is the ratio of air flow through the chamber (Q, m^3/h) to sample surface area (A, m^2). For the small chamber, the test chamber Q/A ratio is set to achieve the same loading factor and air change rate as the large chamber.

Table 2: Minimum acceptable correlation coefficients (“r” values)

Degrees of freedom (n-2)	“r” value
3	0.878
4	0.811
5	0.754
6	0.707
7	0.666
8	0.632
9	0.602
10 or more	0.576

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