



Wood Pellet Manufacturing Facilities

Under the *Environmental Management Act* (EMA), all high-risk, and some medium-risk, industrial operations in British Columbia are required to have government authorization¹ prior to discharging emissions or waste to the environment. These authorizations are legally enforceable and are subject to pollution preventing conditions and criteria. Authorizations for new, or significantly modified, wood pellet manufacturing facilities are developed based on the Ministry's Guideline for Emissions from Wood Pellet Manufacturing Facilities.

The purpose of this document is to summarize key emissions information contained in the Ministry's Guideline for Emissions from Wood Pellet Manufacturing Facilities.

What are guidelines used for?

Guidelines provide assistance to directors, appointed under EMA, when preparing and issuing authorizations for industrial facilities.

What are wood pellets?

Wood pellets are a type of wood fuel, usually produced as a by-product of sawmilling and other wood transformation activities. The pellets are generally made from compacted sawdust and shavings. The sawdust and shavings may be blended with smaller amounts of processed bark, hog fuel, processed standing dead timber and processed landing debris.

Wood pellets are usually 6 to 8mm in diameter and 2cm in length. However, they can be manufactured in other configurations, such as pucks or logs.

¹ Authorizations may include permits, approvals, operational certificates or regulations. For more information on waste discharge authorizations, see:
http://www.env.gov.bc.ca/epd/waste_discharge_auth/index.htm

How are wood pellets produced?

Wood pellets are normally produced by compressing dry wood materials to a desired size. First, raw wood materials are passed through a hammer mill and dryer to achieve consistent moisture content. Then, the dry wood particles are fed to a press. In the press they are squeezed through a die having holes of the required size.

The high pressure causes the temperature of the wood to increase greatly, causing the lignin to plasticize slightly and form a natural 'glue' that holds the pellet together.

How are air emissions produced during the wood pellet manufacturing process?

Air emissions may be produced during the wood pellet manufacturing process from sources such as dryers, coolers, pelletizers, hammermills, and conveyors. Fugitive emissions are also released during the handling, storage and transportation of the materials.

What are the emission limits?

The Guideline for Emissions from Wood Pellet Manufacturing Facilities outlines emission limits for total particulate matter (TPM) and fugitive emissions.

The guideline is based on best achievable technology and describes requirements for both new and significantly modified existing facilities.

New Facilities

The guideline stipulates that all new facilities should install control technologies that will at minimum, achieve the emission limits listed in Tables 1 and 2.

Existing Facilities

The guideline specifies that existing facilities that have undergone significant modifications are expected to meet the applicable monitoring and control requirements listed in Tables 1 and 2. Existing wood pellet manufacturing facilities that have not been significantly modified may continue to operate in accordance with the limits of their current permit.

When has a facility been “significantly modified”?

A facility has been significantly modified if it has undergone a physical or operational change resulting in an increase of 10% or more in the volume of discharge or the total amount of any contaminant released to the environment, based on authorized values.

What is Total Particulate Matter (TPM)?

Particulate matter refers to tiny solid or liquid particles that float in the air. TPM consists of filterable and condensable particulate matter. Filterable particulate matter includes all PM₁₀ and PM_{2.5} emissions, where PM₁₀ and PM_{2.5} are comprised of particulate matter with aerodynamic diameters less than 10 and 2.5 micrometers respectively. Condensable particulate matter is any material that is not particulate matter at stack conditions, but condenses and/or reacts to form particulate matter immediately after discharge from the stack.

Why are TPM emissions limited?

TPM emissions are limited because they can have negative impacts on local air quality and human health. PM_{2.5} is known to cause aggravation of respiratory and cardiovascular disease, reduced lung function, increased respiratory symptoms and premature death. TPM also impairs visibility, affects climate and can damage and/or discolour structures and property.²

² More information on how air quality affects human health can be found in the State of the Air Report 2010 at: <http://www.bc.lung.ca/airquality/documents/StateOfTheAir2010webrvised.pdf>

Note: This summary is solely for the convenience of the reader. The current guideline should be consulted for complete information.

TPM emission limits

The TPM emission limits and monitoring frequency for wood pellet manufacturing facilities outlined in the Ministry’s guideline are summarized in Table 1.

In addition to emission limits listed below, facilities should strive to maintain opacity below 10%. Opacity can be thought of as the amount of light blocked by TPM.

How frequently should TPM emissions be monitored?

The monitoring frequency listed in Table 1 should be followed except in the case of the implementation of new process units. For new units, an operator should undertake baseline monitoring (stack testing) within six months of start up. Thereafter, the operator should continue monitoring at the prescribed monitoring frequency stated in Table 1.

What are fugitive emissions?

Fugitive emissions are unintentional or incidental releases. The significance of fugitive emissions at wood pellet manufacturing facilities may vary depending on the type of raw material, method of transportation and specific process used in the production of the wood pellets. Major sources of these emissions include raw material handling, raw material storage piles, conveyor transfer points, yard dust, haul road dust and engine exhaust.

Fugitive emission limits

Table 2 provides a summary of the limits and monitoring and control strategies detailed in the guideline to mitigate fugitive emissions.

What are the effluent handling requirements?

If the applied emission control technology uses a solution, such as water, any resulting effluent should be delivered to an approved facility for treatment or disposed of in a manner approved by a director.

Are there other considerations?

The information contained in the Ministry's guideline documents are just one of the main pieces of information taken into consideration by the director when approving an authorization. Additional sources of information considered by the director may include environmental impact assessments, local air shed plans, other guidelines and stakeholder input. The director also has the authority to impose emission standards other than those that are recommended in these types of guidelines.

For more information, contact the Environmental Standards Branch at envprotdiv@victoria1.gov.bc.ca

Or, consult our website at http://www.env.gov.bc.ca/epd/industrial/pulp_paper_1umber/pdf/moe-pellet-industry-051410.pdf.

Table 1: Total Particulate Matter Emissions Limits for Wood Pellet Manufacturing Facilities.

Source	Limit ^(a) (mg/m ³)	Monitoring ^(b)
Dryer Exhaust	60 ^(c)	Quarterly
Pellet Cooler Exhaust	115 ^(e)	Annual
Other Plant Processes ^(d)	20 ^(e)	Annual

(a) Concentration limits measured at standard conditions of 20°C, 101.3kPa, dry gas.

(b) All monitoring for this guideline must be carried out in accordance with the latest version of the: *British Columbia Field Sampling Manual – For Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment and Biological Samples.*

(c) The dryer exhaust limit includes filterable and condensable particulate matter. It is an interim two year limit. This limit may be adjusted as more data becomes available.

(d) Other plant processes may include pelletizers, hammermills, storage, screening and conveyors.

(e) Includes filterable particulate matter only.

Table 2. Fugitive Emissions from Raw Material Storage Piles and Road Dust

Source	Limit	Monitoring and Control
Sawdust and Wet Material	No Visible downwind carry over	Visual monitoring with controls as required including: limiting pile heights and limiting exposed pile faces to high winds (e.g. wind breaks; vegetative or screens). Include meteorological controls and planning.
Planer Shavings and Dry Material		As above, plus three sided and covered containment. Prevent vehicle traffic from grinding material finer.
Onsite Haul Roads		Dust suppression in dry season or paving.