

## Section 5.3. Dust-Producing Processes

### 5.3.1. General

#### 5.3.1.1. Application

1) This Section shall apply to *buildings* or parts of *buildings* where *combustible dusts* are produced in quantities or concentrations that create an explosion or fire hazard.

#### 5.3.1.2. Dust Removal

1) *Building and machinery surfaces shall be kept clean of accumulations of combustible dusts* using cleaning equipment that

- a) is made of materials that will not create electrostatic charges or sparks,
- b) is electrically conductive and bonded to ground, and
- c) except as permitted in Sentence (3), removes the dust to a safe location by vacuum.

2) Cleaning equipment required in Sentence (1) that is used in an atmosphere containing *combustible dusts* shall conform to the British Columbia Electrical Safety Regulation.

3) Where it is not possible to effectively remove the dust by vacuum, it is permitted to use compressed air or other means that will cause the dust to become suspended in the air during removal if, in the dust removal area,

- a) all sources of ignition are eliminated, and
- b) all machinery and equipment is de-energized, unless such machinery or equipment is suitable for use in atmospheres containing *combustible dusts*, in conformance with the British Columbia Electrical Safety Regulation.

#### 5.3.1.3. Dust-Collecting Systems

1) Dust-collecting systems shall be provided to prevent the accumulation of dust and keep suspended dusts at a safe concentration inside a *building*.

- 2) A dust-collecting system required in Sentence (1) shall
- a) be designed in conformance with good engineering practice,
  - b) be made of noncombustible materials, and
  - c) not create sparks upon physical contact in the fan assembly.

(See Note A-5.3.1.3.(2).)

#### 5.3.1.4. Dust Collectors

1) Except as provided in Sentence (2), a dust collector having a capacity greater than 2.36 m<sup>3</sup>/s shall

- a) be located outside of a *building*, and
- b) be equipped with explosion venting to the outdoors of not less than 0.1 m<sup>2</sup> of vent area for each cubic metre of dust collector enclosure volume.

2) A dust collector described in Sentence (1) is permitted to be located inside a *building* if it is

- a) provided with explosion venting to the outdoors as specified in Clause (1)(b),
- b) equipped with an automatic explosion prevention system, or
- c) located in a room with *fire separations* having a *fire-resistance rating* of not less than 1 h and provided with explosion venting to the outdoors.

3) When air exhausted by a dust collector described in this Article is returned to a *building*, the dust-collecting system shall be designed so that

- a) returned air will not create an explosion hazard inside the *building*, and
- b) the exhaust fan and ancillary equipment are automatically shut down in the event of a fire or an explosion inside the dust collector.

**5.3.1.5. Bonding and Grounding**

1) Electrically conducting parts of conveying systems, dust collectors, dust-producing machines and any equipment capable of accumulating static electricity located in an atmosphere containing *combustible dusts* shall be electrically bonded and grounded.

2) Static electricity shall be prevented from accumulating on machines or equipment subject to static electricity buildup by appropriate bonding, grounding and static eliminating devices.

**5.3.1.6. Explosion Venting**

1) Except as provided in Article 5.3.1.7., an activity that creates an atmosphere containing significant concentrations of *combustible dusts* shall be located only in a *building* provided with explosion venting to the outdoors.

2) When explosion venting is required in this Section, it shall be designed to prevent critical structural and mechanical damage to the *building* in conformance with good engineering practice such as that described in NFPA 68, “Explosion Protection by Deflagration Venting.” (See Note A-3.2.8.2.(1)(d).)

**5.3.1.7. Explosion Prevention Systems**

1) In processes where an explosion hazard is present and conditions exist that prevent adequate explosion venting as required in this Section, an explosion prevention system shall be provided.

2) When an explosion prevention system is required in this Section, it shall be designed in conformance with good engineering practice such as that described in NFPA 69, “Explosion Prevention Systems.”

**5.3.1.8. Electrical Interlocks**

1) Equipment required to have a dust-collecting system shall be interlocked to prevent it from operating if the dust-collecting system is not in operation.

**5.3.1.9. Separators**

1) Separators shall be provided to prevent the entrance of foreign materials that may cause sparks in conveying equipment, dust collectors, dust-producing machines and any equipment located in an atmosphere containing *combustible dusts*.

**5.3.1.10. Ignition Sources**

1) Unless controlled in a manner that will not create a fire or explosion hazard, a device, operation or activity that produces open flames, sparks or heat shall not be permitted. (See Note A-4.1.5.2.(1).)

2) Portable electrical equipment used in atmospheres containing *combustible dusts* shall conform to the British Columbia Electrical Safety Regulation.

3) Smoking shall not be permitted in atmospheres containing *combustible dusts*.

**5.3.2. Woodworking Operations****5.3.2.1. Exhaust Systems**

1) Every machine that produces wood dust, particles or shavings shall be provided with a blower and exhaust system installed in conformance with NFPA 664, “Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities.”

2) Operations or machines that generate sparks or combustible vapours shall not be served by exhaust systems connected to woodworking machines referred to in Sentence (1).

**5.3.2.2. Shavings and Sawdust Collection**

1) Loose shavings and sawdust shall be collected at frequent intervals and deposited in receptacles described in Article 2.4.1.3.

**5.3.2.3. Fire Extinguishers**

1) A portable extinguisher shall be provided within 7.5 m of any machine producing wood dust, particles or shavings.

**5.3.3. Grain Handling and Storage Facilities****5.3.3.1. Storage Bins and Silos**

1) A product subject to spontaneous heating shall be permitted to be stored in silos or bins only if measures are taken to

- a) monitor the temperature of the stored product, and
- b) prevent overheating of the stored product from creating a fire or explosion hazard.

2) Permanently open vent stacks are permitted to be used for the ventilation of storage bins where mechanical dust-collecting systems are not practical provided that the vent stacks

- a) have a cross-sectional area not less than twice that of all spouts discharging into the bin,
- b) are installed not more than 30° from the vertical,
- c) extend from the top of the bin to a point not less than 1.2 m above the roof, and
- d) are designed to prevent the entry of snow and rain.

**5.3.3.2. Conveying Equipment**

1) Belt conveyors and bucket elevator legs shall be equipped with safety devices to

- a) detect excessive misalignment, blockage, slipping or slow-down of the conveying equipment, and
- b) prevent conditions described in Clause (a) from creating a fire or explosion hazard by
  - i) alerting personnel trained in taking appropriate actions, or
  - ii) automatically stopping the conveying equipment.

2) Conveying equipment belts shall be made of static conductive materials to prevent buildup of static charges. (See Note A-5.3.3.2.(2).)

3) Conveying equipment bearings shall be

- a) accessible for inspection and maintenance,
- b) lubricated to prevent overheating, and
- c) kept free of accumulation of *combustible dusts*.

4) Belt conveyor galleries and tunnels and bucket elevator leg enclosures shall be provided with explosion venting to the outdoors in conformance with Sentence 5.3.1.6.(2).

**5.3.3.3. Separators**

1) Separators shall be provided at grain receiving points ahead of the conveying equipment.

(See Article 5.3.1.9.)

**5.3.3.4. Fire Protection**

1) Nozzles for standpipe and hose systems shall conform to Sentence 3.2.5.11.(7) of Division B of the British Columbia Building Code.