



**TOPIC: BREWERIES AND DISTILLERIES OSSC 3/#5  
and OSSC 4/#5**

**CODE: Oregon Structural Specialty Code, 2014 edition  
Oregon Fire Code, 2014 edition**

**APPROVED: May 7, 2018 [ Rebecca Esau ], Director**

**REFERENCE: Oregon Structural Specialty Code - Chapters 3, 4 and  
Appendix N  
Oregon Fire Code – Chapter 22  
National Fire Protection Association 654**

**SUBJECT: Combustible Dust and Flammable Liquids in Breweries  
and Distilleries.**

**QUESTION: What is the building occupancy classification for breweries and  
distilleries? When is a Hazardous Materials Report required?**

**RESPONSE: An H-2 occupancy will be assigned to breweries and distilleries,  
who mill, grind or crack grain on site. If an applicant is proposing a  
lower occupancy classification than H-2 applicants may need to submit a Hazardous  
Materials Report for evaluation. A Hazardous Materials Report may also be necessary  
when quantities of flammable liquids, such as alcohol, in an open system, closed  
system or storage area exceeds the Maximum Allowable Quantities (MAQ) per the  
Oregon Structural Specialty Code (OSSC).**

**I. Definitions and Terminology:**

The definitions below are either directly from or based on the definition provided in the OSSC, the Oregon Fire Code (OFC) or are an industry term.

**Brewery.** A facility that produces beer by mixing grist in water and then fermenting it with yeast to yield a product with a maximum alcohol content of 16%.

**Building Code Appeal.** A formal process in a group setting where the Building Official decides of building, mechanical, electrical or plumbing code compliance regarding specific code interpretations, alternate materials or designs, methods of construction and types of equipment. Where necessary, supporting data including research, test reports, technical data, calculations and other documentation as necessary may be required to demonstrate that the intent and purpose of the code is met.

For this code guide, there are a few situations when a building code appeal may apply;

- To evaluate a Hazardous Materials Report;
- If the proposal does not meet the specifications of this code guide or the building code; or
- If the proposal does not include all the information required by this code guide.

**Closed System.** The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product conveyed through a piping system into a closed vessel system or piece of equipment.

**Combustible Dust.** Finely divided solid material which is 420 microns or less in diameter and which, when dispersed in the air in the proper proportions, could be ignited by a flame, spark, or other source of ignition. Combustible dust can pass through a U.S. No. 40 standard sieve.

**Distillation.** Is a process that may begin by following a similar fermentation method as a brewery. Distilleries may have alcohol delivered from off site. In either process, general distillation is accomplished by boiling and re-condensing the liquid multiple times in a still to concentrate the alcohol for a final product with a minimum alcohol content of more than 20% and up to 96%.

**Grist.** Grain that has been through a grist mill / grinder.

**Grist Hopper.** The grist hopper holds the cracked, malted grain and controls its flow into a mash tun.

**Hazardous Materials Inventory Statement (HMIS).** An HMIS is a document that contains information necessary to determine the applicable controls and fire protection requirements for the storage and use of hazardous materials. It may be part of a Technical Opinion Report, a Hazardous Materials Report, or submitted as a stand-alone document. If a Hazardous Materials Report is *not* requested by the Life Safety Building Code plans examiner an HMIS may be requested by the Fire Marshal (2014 OFC Section 5001.5.2). Based on the information provided in the HMIS, the Fire Marshal may request a full Technical Opinion Report. The 2014 OFC appendices H, Figure 4 & 5 are the primary reference documents for an HMIS. An inventory of materials and site plan must also be provided.

**Hazardous Materials Management Plan (HMMP).** An HMMP seeks to identify general facility and site information including the classification and quantities of hazardous materials found on site for storage and/or use. Per the 2014 OFC Section 407 in accordance with Section 5001.5.1. an HMMP shall be requested by the Fire Bureau as needed on a case by case basis.

**Hazardous Materials Report (414 report).** A Hazardous Materials Report is also referred to as a 414 report because it addresses information required by OSSC Section 414.1.3. This report will be requested by the Life Safety Plans examiner when an occupancy classification is not established due to the presence of combustible dust. It may also be requested when other hazardous materials such as flammable liquids will be present. Per Section 414, the report "...shall be submitted to the Building Official identifying the maximum expected quantities of hazardous materials to be stored and used in a closed or open system. The uses shall be subdivided separately to address hazardous material classification categories based on OSSC Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the Building Official and provided without charge to the City." The report may be subject to verification and approval by the Building Official through the building code appeal process.

A Hazardous Materials Report typically contains similar information as the *Technical Opinion Report* defined below.

**Malting.** A three-step process including steeping, germinating and drying of grain, typically barley. Malted barley is a basic ingredient in beer production to aid in fermentation. Malting reduces the dust hazard up to the point of milling or cracking.

**Mash Tun.** A vessel where grist is mixed with hot water to allow the starches in the grain to be converted to sugars for fermentation.

**Maximum Allowable Quantity (MAQ).** The maximum amount of a hazardous material allowed to be stored or used within a structure that does not have a hazardous occupancy classification.

**Milling Room.** The room or rooms in a brewery where the grain is processed through a machine to crack open the grain. If the milling machine is not in a separate room, the entire area it is open to will be considered the milling room. While a brewery is typically an F2 occupancy, the milling room is considered an H2 occupancy due to the higher level of grain combustibility.

**Occupant Load Factor.** The area in square feet, per occupant that determines the design occupant load calculation of a building or portion thereof based on the function of the space. Typical occupant load factors in the production areas of breweries and distilleries are as follows; brewery milling room (100 sf/occupant); warehouse/storage for grain or product (500 sf/occupant); office space (100 sf/occupant); and office assembly such as conference rooms (15 sf/occupant).

**Open System.** The use of a solid or liquid hazardous material involving a vessel or system that is continuously open to the atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Examples of open systems for solids and liquids include dispensing from or into open beakers or containers, dip tank and plating tank operations.

**Qualified Person.** A qualified engineer, specialist, or person with a fire safety specialty, that can analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to recommend necessary changes. Qualifications must be acceptable to the Building and Fire Code officials

**Technical Opinion Report.** A report required under the OFC Section 104.7.2, that is like the information requested in a Hazardous Materials Report under OSSC 414, defined above. Technical Opinion Reports shall be prepared by a qualified person. This report is requested by the Fire Marshal on a case by case basis when the occupancy classification is already established and a Hazardous Materials Report is not required by the Life Safety Building Code plans examiner.

## II. Determining Occupancy

**A. Occupancy Classifications**

**OSSC Chapters 306 and 307**

Distilleries and breweries that do not mill, grind or crack grain on site are typically classified as an F-Fabrication occupancy (distilleries are an F-1 and breweries an F-2). There are two common substances that, when present, may require a hazardous classification; combustible dust and alcohol.

1. **Combustible Dust.** Facilities with the potential for combustible dust are considered an H-2 classification. If an occupancy classification other than H-2 is proposed, then a Hazardous Materials Report may be necessary to determine whether the dust generated from the facility creates a fire or explosion hazard. Combustible dust can be produced from the handling of grain or from the grain milling or cracking process. Unlike other hazardous materials, there are no limits set within the building or fire code that define when dust quantities create a hazardous condition. Numerous factors contribute to unsafe dust levels including, but not limited to, the type of dust, density and size of dust particles, ventilation, and atmospheric conditions. These individual factors can each alleviate or contribute to a hazardous environment and will need to be evaluated if a lower occupancy classification is proposed.
2. **Alcohol.** Buildings with alcohol quantities that exceed the MAQs are considered either an H-2 or H-3 occupancy, depending on whether the operating pressure is above or below 15 pounds per square inch. Additionally, the OSSC specifies limits on the maximum allowable quantities of alcohol in open and closed use and for alcohol storage. Where limits are exceeded, the following classifications will apply (OSSC Section 307.4 and 307.5).
  - H-2 classifications will apply where the alcohol is used or stored in normally open containers or systems or where the alcohol is used or stored in normally closed containers or for systems pressurized at more than 15 psi gage.
  - H-3 classification will apply where the alcohol is used or stored in normally closed containers or where the alcohol is within systems pressurized at 15 psi gage or less.
  - Reference OFC Table 5003.1.1 (1) footnote C.

Note: Under the OSSC and the OFC, alcoholic beverages greater than 16% and less than or equal to 55% Alcohol by Volume (ABV) are classified as flammable 1C liquids. When ABV is greater than 55% they are classified as flammable 1B liquids. The MAQ is the same whether the alcohol is classified as 1B or 1C.

**B. Hazardous Material Report Requirements for Breweries and Distilleries that Mill or Crack Grain**

Where cracking grain is proposed an H-2 occupancy is assumed. If a different occupancy classification is proposed, the applicant may be asked to submit a Hazardous Materials Report. The report must sufficiently detail the use of the building and address the following items:

1. The report must be prepared by a qualified individual or company that can demonstrate sufficient background and training in hazardous occupancies to be acceptable to the building and fire code officials. Licensure as an Oregon design professional is not required.
2. The report must comply with the definition of a Hazardous Materials Report as defined in Section 1A.
3. The report must provide information on the grain delivery method (bags or in bulk/loose) and indicate if the grain has been through the malting process.
4. If a silo is proposed for grain storage then provide the manufacturer specifications with sufficient detail for structural attachment review. The plans and/or specifications shall clearly identify the method of filling and discharging grain, the filter type and recommended filter cleaning and replacement schedule. The silo must be indicated on site plans in relation to other building(s) and property lines.
5. Provide an equipment lay-out plan with the conveyance system route, if applicable, including information on how the grain is milled and/or how cracked grain is moved to the mash tun.
6. The report shall include information on how grain is delivered to the grinding room once on site (flex auger, cablevey, other).
7. The report shall provide information on the conveyance system including the following:
  - a. Construction methods,
  - b. Dust tightness,
  - c. Maintenance,

- d. Manufacturer's specifications,
  - e. Bonding/grounding of equipment, and
  - f. Identify "industry standard" magnet installation in the handling and conveyance equipment.
8. The report shall include a UL listed explosion proof motor on grain handling equipment motor(s) and grinding motor(s) located in the grinding room.
  9. The report shall identify any spark producing equipment in the grain handling area, and identify other potential hazards and proposed mitigation.
  10. The report shall include information on how fine the grain is milled or cracked (microns or sieve).
  11. The report shall indicate the grain storage location, ventilation, area and capacity.
  12. The report shall specify dust control procedures in accordance with Portland Fire Code Chapter 22, Sections 2204 and 2205.
  13. Dust control may be required based on excessive accumulation of dust as determined at subsequent inspections by the Fire Marshal. Proposed mitigation is subject to Fire Marshal and/or the Building Official approval.

### **III. Applicability**

This section provides examples of applicable building occupancy classifications and when a Hazardous Materials Report is necessary for new construction, tenant improvement or when cited by a Fire Inspector for operating beyond the scope of an F-1 occupancy.

#### **A. Breweries Using Grain in Pre-Milled Bags**

When malted grain is delivered pre-milled in bags there is a lower risk for combustible dust generation. Therefore, the following apply.

1. A 3<sup>rd</sup> party Hazardous Materials Report is not required for combustible dust.
2. The brewery occupancy classification is F-2.
3. A building code appeal is not required.
4. An HMIS is not required unless triggered by other materials.

4. Dust control may be required based on excessive accumulation of dust as determined at subsequent inspections by the Fire Marshal. In these cases, a mitigation plan is subject to Fire Marshal and/or Building Official approval.

**B. Breweries with Grain Delivered in Bulk**

When grain is delivered in bulk to a silo, bin, or grain room and grain is cracked on site, there is an increased risk for combustible dust generation. Therefore, the following apply:

1. An H-2 occupancy shall be assigned.
2. If an H-2 occupancy is not disputed by the applicant a Technical Opinion Report may be requested by the Fire Marshal.
3. If an F occupancy is proposed by the applicant then a Hazardous Materials Report, conforming to Section II.B above, shall be submitted to the Building Official to address the combustible dust hazard.
4. A building code appeal may be required to evaluate a Hazardous Materials Report.

**C. Distilleries**

1. Some distilleries contain both brewing and distilling operations. When this occurs the grain delivery, handling, milling and fermenting requirements are the same as a brewery depending on which of the two examples above are followed.
2. Where alcohol is delivered from off site for distillation the occupancy is F-1 or H depending on the system pressure, and the quantities of alcohol in open system, closed system and storage. In a non-sprinklered building the maximum allowable quantity for alcohol in open use is 30 gallons for an F-1 occupancy. Filling a standard 53-gallon barrel with an open use process will trigger an H occupancy.
3. Barrel storage with a one-hour fire rated control area is exempt from the MAQ restriction and is not included in the MAQ of the processing areas. The occupancy of the barrel storage control area is S-1 per the State of Oregon Building Codes Division, Statewide Code Interpretation No. 15-02, Craft Distillery Occupancy Classification.



4. Stills and receivers not listed or labeled by a nationally recognized organization shall be evaluated as part of a Hazardous Materials Report or Technical Opinion Report as applicable (see definitions in section 1A). A building code appeal with equipment designed by an Oregon licensed engineer may be required.

#### **D. Combustible Dust and Flammable Liquids**

This section includes examples of building occupancy classifications and Hazardous Materials Report applicability within either an existing F-1 or F-2 occupancy. These scenarios address combustible dust hazards and alcohol quantities that may not have been fully evaluated at the time of application review or where conditions have changed since permit issuance.

##### **1. Existing Breweries**

If an existing brewery with an F-2 occupancy is seeking a tenant improvement permit or if cited by the Fire Bureau for operating outside the scope of an F-2 occupancy then the applicant shall submit the following information:

- a. A detailed description of grain storage, cracking and conveyance.
- b. A Hazardous Materials Report, as needed, to determine occupancy classification (F-2 or H).
- c. When a Hazardous Materials Report is required a building code appeal may also be required.
- d. An HMIS is not typically necessary unless required by other materials.

Note, the following sentence shall be included on plans that are submitted for building permit review, "future changes not within the scope of the permit or safety concerns found by a Fire Inspector may require re-evaluation of an existing F-2 occupancy."

##### **2. Existing Distilleries**

Where an existing distillery with an F-1 occupancy is seeking a tenant improvement permit or when cited by the Fire Bureau for

operating beyond the scope of an F-1 occupancy, the applicant shall submit the following information:

- a. A detailed description of the distillery process.
- b. A Hazardous Materials Report may be required.
- c. A building code appeal may be required.
- d. An HMIS.
- e. Plan preparation by an Oregon licensed design professional or a qualified person may be required.

Note: The Building Official and/or the Fire Marshal may determine additional protective measures for fire and explosion protection as they deem necessary, and as may be required with periodic modifications of the brewing or distilling processes, materials or equipment.