

Classification of Woodworking Shops



A question frequently asked by electrical contractors concerns the classification of facilities used for the storage, manufacturing or processing of timber, lumber or wood byproducts.

In the commentary for Section 503.1, the 2014 edition of the National Electrical Code (NEC) Handbook states that Class III locations usually include textile mills that process cotton, rayon, and other fabrics, where easily ignitable fibers/flyings are present in the manufacturing process. Sawmills and other woodworking plants, where sawdust, wood shavings, and combustible fibers/flyings are present, may also become hazardous.

If wood flour (dust) is present, the area is considered a Class II, Group G hazardous location, not a Class III location. The term “wood flour” is generally understood to be wood reduced to finely divided particles approximating those of cereal flours in size, appearance, and texture. Per NFPA 499: *Recommended Practice for the Classification of Combustible Dusts* any finely divided solid material that is 500 microns or smaller in diameter should be considered to present a dust fire or dust explosion hazard.

These types of occupancies (i.e. cabinet shops, woodworking facilities and such) are classified based on NEC Article 500.5(C)(2)(2 & 3) where combustible wood dust is present, however, under normal conditions the environment is maintained so the combustible dust does not accumulate or interfere with operations. In that case, the area would be categorized as a Class II, Division 2, Group G. If the dust removal system sufficiently eliminates the wood flour the shop area may even be considered an unclassified space based on National Fire Protection Association (NFPA) 499 *Recommended Practice for the Classification of Combustible Dusts*.

(C) Class II Locations. Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations shall include those specified in NEC Sections 500.5(C)(1) and(C)(2).

(2) Class II, Division 2. A Class II, Division 2 is a location

(2) Where combustible dust accumulations are present but are normally *insufficient* to interfere with the normal operation of electrical equipment or other apparatus, but could

as a result of infrequent malfunctioning of handling or processing equipment become suspended in the air; or

(3) In which combustible dust accumulations on, in, or in the vicinity of the electrical equipment could be sufficient to interfere with the safe dissipation of heat from electrical equipment, or could be ignitable by *abnormal operation or failure* of electrical equipment.

Further guidance can be found in NFPA 499 which explains that in a Class II Division 2 hazardous (classified) area there will be no visible dust cloud under normal operation and no dust accumulation exceeding 1/8th of an inch in depth.

NFPA 499 also addresses how to recognize areas that are generally deemed to not require classification, or “unclassified locations”.

Section 5.4.1 states: Experience has shown that the release of ignitable dust suspensions from some operations and apparatus is so infrequent that a classification is not necessary. Examples include: combustible dusts that are processed, stored, or handled under the following conditions.



1. Where materials are stored in sealed containers
2. Where materials are transported in well-maintained closed piping systems.
3. Where palletized materials with minimum dust are handled or used.
4. Where closed tanks are handled or stored.

The section recognizes that classification may not be required in situations where dust removal systems or excellent housekeeping prevent dust clouds or layer accumulations that make surface colors indiscernible, provided that the dust removal systems have safe guards and warnings against failure.