

Informational Note No. 1: The quantity of combustible dust that may be present and the adequacy of dust removal systems are factors that merit consideration in determining the classification and may result in an unclassified area.

Informational Note No. 2: Where products such as seed are handled in a manner that produces low quantities of dust, the amount of dust deposited may not warrant classification.

**(D) Class III Locations.** Class III locations shall be locations meeting the requirements of 500.5(D)(1) and (D)(2).

Δ **(1) Class III, Division 1.** Class III, Division 1 locations shall include those locations specified in 500.5(D)(1)(a) and (D)(1)(b).

(a) *Combustible Fibers/Flyings.* Locations where nonmetal combustible fibers/flyings are in the air under normal operating conditions in quantities sufficient to produce explosible mixtures or where mechanical failure or abnormal operation of machinery or equipment might cause combustible fibers/flyings to be produced and might also provide a source of ignition through simultaneous failure of electrical equipment, through operation of protection devices, or from other causes shall be classified as Class III, Division 1. Locations where metal combustible fibers/flyings are present shall be classified as Class II, Division 1, Group E.

Informational Note No. 1: Such locations usually include some parts of rayon, cotton, and other textile mills; associated manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.

Informational Note No. 2: Combustible fibers/flyings include flat platelet-shaped particulates, such as metal flakes, and fibrous board, such as particle board.

(b) *Ignitable Fibers/Flyings.* Locations where ignitable fibers/flyings are handled, manufactured, or used shall be classified as Class III, Division 1.

Informational Note No. 1: Such locations usually include some parts of rayon, cotton, and other textile mills; associated manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.

Informational Note No. 2: Ignitable fibers/flyings can include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

Δ **(2) Class III, Division 2.** Class III, Division 2 locations shall include those locations specified in 500.5(D)(2)(a) and (D)(2)(b).

(a) *Combustible Fibers/Flyings.* Locations where nonmetal combustible fibers/flyings might be present in the air in quantities sufficient to produce explosible mixtures due to abnormal operations or where accumulations of nonmetal combustible fibers/flyings accumulations are present but are 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 shall be classified as Class III, Division 2.

(b) *Ignitable Fibers/Flyings.* Locations where ignitable fibers/flyings are stored or handled, other than in the process of manufacture, shall be classified as Class III, Division 2.

## 500.6 Materials.

In a hazardous location, oxygen enrichment can drastically change the explosion characteristics of materials. It lowers minimum ignition energies, increases explosion pressures, and can reduce the maximum experimental safe gap. This can render both intrinsically safe and explosionproof equipment unsafe unless the equipment has been tested for the specific conditions involved.

An oxygen-rich environment is not, in itself, a hazardous location according to Article 500; however, such an environment does pose specific design and installation challenges. Equipment found to be safe in ordinary atmospheric conditions is not necessarily safe in oxygen concentrations or pressures higher than those of the standard atmosphere. NFPA 53, *Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres*, recommends that no electrical equipment be used in such atmospheres unless approved for use in the specific hazardous atmospheres at the maximum proposed pressure and oxygen concentration.

Δ **(A) Class I Group Classifications.** Class I groups shall be in accordance with 500.6(A)(1) through (A)(4).

Informational Note No. 1: The explosion characteristics of air mixtures of gases or vapors vary with the specific material involved. For Class I locations, Groups A, B, C, and D, the classification involves determinations of maximum explosion pressure and maximum safe clearance between parts of a clamped joint in an enclosure. It is necessary, therefore, that equipment be identified not only for class but also for the specific group of the gas or vapor that will be present.

Informational Note No. 2: Certain chemical atmospheres may have characteristics that require safeguards beyond those required for any of the Class I groups. Carbon disulfide is one of these chemicals because of its low autoignition temperature (90°C) and the small joint clearance permitted to arrest its flame.

NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, contains a list of selected chemicals categorized by group. For the complete table, refer to NFPA 497, Table 4.4.2.

For dust materials, NFPA 499, *Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, contains a list of dust materials categorized by group. For the complete table, refer to NFPA 499, Table 5.2.3.

**(1) Group A.** Acetylene. [497:3.3.5.1.1]

Δ **(2) Group B.** Flammable gas, flammable liquid-produced vapor, or combustible liquid-produced vapor mixed with air that may burn or explode, having either a maximum experimental