Pursuant to Section 5 of the NFPA Regulations Governing the Development of NFPA Standards, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, 2021 edition. The TIA was processed by the Technical Committee on Electrical Equipment in Chemical Atmospheres, and was issued by the Standards Council on April 15, 2021, with an effective date of May 5, 2021.

1. Revise 3.3.3, and associated Annex material to read as follows:

   **3.3.3 Combustible Dust.** Solid Dust particles that are 500 µm or smaller (i.e., material passing a U.S. No. 35 Standard Sieve as defined in ASTM E11-17, Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves) that can form an explosible mixture when suspended in air at standard atmospheric pressure and temperature and present a flash-fire hazard or explosion hazard when dispersed and ignited in air.

   A.3.3.3 Combustible Dust. See ASTM E1226, Standard Test Method for Explosibility of Dust Clouds, ISO 6184–1, Explosion protection systems — Part 1: Determination of explosion indices of combustible dust in air, or ISO/IEC/UL 80079-29-2, Explosive atmospheres — Part 20-2: Material characteristics — Combustible dusts test methods, for procedures for determining the explosibility of dusts. Historically, the explosibility condition has been described as presenting a flash fire or explosion hazard. It could be understood that the potential hazard due to the formation of an explosible mixture when suspended in air at standard atmospheric pressure and temperature would include ignition.

B.1.2.2 ISO Publications. ISO/IEC/UL 80079-20-2…

2. Revise/renumber 3.3.4, through 3.3.10, and associated Annex material to read as follows:

   **3.3.4.5 Combustible Fibers/Flyings.**

   As used in this recommended practice, flyings refers to a particle with a small cross-sectional area and a length greater than 500 μm. Section 500.5 of NFPA 70 defines a Class III location. Combustible fibers/flyings can be similar in physical form to ignitable fibers/flyings and protected using the same electrical equipment installation methods. Flying is a general term encompassing any particle that can be suspended in air and that has one or more dimensions greater than 500 µm. Examples of fibers/flyings include flat platelet-shaped particulate, such as metal flake, and fibrous particulate, such as particle board core material. To be covered by this recommended practice, the particle must present a flash-fire hazard or explosion hazard when suspended in air. If the smallest dimension of a combustible...
material solid is greater than 500 μm, it is unlikely that the material would be combustible dust or combustible fibers/flyings, as determined by test. Finely divided solids with lengths that are large compared to their diameter or thickness usually do not pass through a 500 μm sieve, yet when tested could potentially be determined to be explosible, still pose a deflagration hazard.

Combustible flyings that present a flash-fire hazard or explosion hazard when dispersed in air must first be capable of being suspended in air under typical test conditions. The typical test methods for evaluating an explosible mixture flash-fire or explosion hazard are ASTM E1226, Standard Test Method for Explosibility of Dust Clouds, ISO 6184-1, Explosion protection systems — Part 1: Determination of explosion indices of combustible dusts in air, or ISO/IEC/UL 80079-20-2, Explosive atmospheres — Part 20-2: Material characteristics — Combustible dusts test methods, for procedures for determining the explosibility of dusts. A material that is found to not present an explosible mixture flash-fire or explosion hazard could still be an ignitible fiber/flying, as defined in 3.3.74.2. Historically, the explosibility condition has been described as presenting a flash fire or explosion hazard. It could be understood that the potential hazard due to the formation of an explosible mixture when suspended in air at standard atmospheric pressure and temperature would include ignition.

3.3.56 Hybrid Mixture. …

3.3.7* 3.3.4.2* Ignitible Fibers/Flyings. A finely divided combustible particulate solid with at least one dimension larger than 500 μm (i.e., material that will not pass through a U.S. No. 35 standard sieve as defined in ASTM E11, Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves) that is not likely to be in suspension and that presents a fire hazard. Fibers/flyings where any dimension is greater than 500 μm in nominal size, which are not likely to be in suspension in quantities to produce an explosible mixture, but could produce an ignitable layer fire hazard.

3.3.1 A.3.3.4.2 Ignitible Fibers/Flyings. Section 500.5 of NFPA 70 defines a Class III location as one where ignitible fibers/flyings are present, but not likely to be in suspension in the air in quantities sufficient to produce ignitible mixtures. This description addresses fibers/flyings that do not present a flash-fire hazard or explosion hazard by test. This could be because those fibers/flyings are too large or too agglomerated to be suspended in air in sufficient concentration, or at all, under typical test conditions. Alternatively, this could be because they burn so slowly that, when suspended in air, they do not propagate combustion at any concentration.

The zone classification system does not address ignitible fibers/flyings. Where these are present, the user should consider installation in accordance with Article 503 of NFPA 70.

3.3.68 Ignitable Mixture. …

3.3.79 Material Form. …

3.3.8 Material Groups.

3.3.8.1 Combustible Dust Division Material Groups. The division area classification, addressed in Articles 500 and 502 of NFPA 70, divides combustible dusts into Group E, Group F, and Group G.

3.3.8.1.1* Group E. Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment.

3.3.8.1.2* Group F. Atmospheres containing combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles (see ASTM D3175, Standard Test Method for Volatile Matter in the Analysis Sample of Coal and Coke, for coal and coke dusts) or that have been sensitized by other materials so that they present an explosion hazard.

3.3.8.1.3* Group G. Atmospheres containing combustible dusts not included in Group E or Group F, including flour, grain, wood, plastic, and chemicals.

3.3.8.1.3 Group G. Some carbonaceous dusts with low volatiles will burn but are not combustible dusts as defined by this document. An example would be certain carbon blacks produced by pyrolyzing acrylonitrile. Atmospheres containing combustible nonmetal fibers/flyings or ignitible fibers/flyings are Class III locations.

3.3.8.2 Zone Material Groups. The zone area classification, addressed in Article 506 of NFPA 70, divides combustible materials into Group IIIA, Group IIIB, and Group IIIC.

3.3.8.2.1 Group IIIA. Combustible metal dust, including combustible metal fibers/flyings. Group IIIA is equivalent to Class II, Group E.

3.3.8.2.2 Group IIIB. Combustible dust other than combustible metal dust. Group IIIB is equivalent to Class II, Groups F and G.
Combustible fibers/flyings other than metal. Solid particles, other than combustible metal, including fibers, greater than 500 µm in nominal size that might be suspended in air and could settle out of the atmosphere under their own weight. Group IIIA is equivalent to Class III.

Group IIIA materials are larger particle-size Group IIIB materials and do not include metal dust or metal fibers/flyings.

Unclassified Locations …

3. Delete/revise/renumber 4.4 through 4.7 to read as follows:


4.1 Combustible Dust Groups. Combustible dusts are addressed in Articles 500, 502, and 506 of NFPA 70.

4.2 Combustible Dust Division Groups. In combustible dust divisions, the combustible dust is divided into Group E, Group F, and Group G.

4.2.1 Group E. Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment.

4.2.2 Group F. Atmospheres containing combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles (see ASTM D3175, Standard Test Method for Volatile Matter in the Analysis Sample of Coal and Coke, for coal and coke dusts) or that have been sensitized by other materials so that they present an explosion hazard.

4.2.3 Group G. Atmospheres containing combustible dusts not included in Group E or Group F, including flour, grain, wood, plastic, and chemicals.

4.3 Combustible Dust Zone Groups. In combustible dust zones, the combustible dust is divided into Zone Group IIIC, Group IIIB, and Group IIIA.

4.3.1 Group IIIC. Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present similar hazards in the use of electrical equipment.

4.3.2 Group IIIB. Atmospheres containing one of the following:

1. Combustible carbonaceous dusts that have more than 8 percent total entrapped volatiles (see ASTM D3175, Standard Test Method for Volatile Matter in the Analysis Sample of Coal and Coke, for coal and coke dusts) or that have been sensitized by other materials so that they present an explosion hazard

2. Combustible dusts not included in Zone Group IIIC, including flour, grain, wood, plastic, and chemicals.

4.3.3 Group IIIA. Solid particles, including fibers, greater than 500 µm in nominal size, which may be suspended in air and could settle out of the atmosphere under their own weight. Group IIIA is equivalent to Class III.

4.5 Hybrid Mixtures …

4.6 Electrostatic Discharges …

4.7 Ignition Criteria …

4. Revise Table 5.2.3 Note (3) to read as follows:

Table 5.2.3 Selected Combustible Dusts

(3) Combustible metal fibers/flyings, as defined in 3.3.4.4, are Group E/IIIC materials.

5. Revise 6.1.3 and associated Annex material to read as follows:

6.1.3 Where atmospheres contain Group IIIA materials, or combustible fibers/flyings other than combustible metal fibers/flyings, the classification diagrams for Group IIIB or Group F, or G, should be applied to determine the extent of the hazardous (classified) location. The location should be Zone 20, Zone 21, or Zone 22, Class III, Division 1 or Class III, Division 2 as appropriate.

A.6.1.3 The area classification diagrams for Group IIIB, Group F or Group G are used for the determination of distances. While Group IIIA combustible fibers/flyings materials present a different hazard than Class III ignitable fibers/flyings, the protection techniques are similar. NFPA 70 addresses suitable protection techniques for these materials.

6. Revise 6.2.3.5 to read as follows:

6.2.3.5 If Group F, G, IIIB, or IIIA materials are present in quantities sufficient to be hazardous only as a result of infrequent malfunctioning of handling or processing equipment, and ignition can result only from abnormal operation or failure of electrical equipment, the location should be classified Class II, Division 2 or Zone 22. If Group F or G materials are present in quantities sufficient to be hazardous only as a result of infrequent malfunctioning of handling or processing equipment, and ignition can result only from abnormal operation or failure of electrical equipment, the location should be classified Class II, Division 2.
be hazardous only as a result of infrequent malfunctioning of handling or processing equipment, and ignition can result only from abnormal operation or failure of electrical equipment, the location should be classified Zone 22.