

# CLASSIFICATIONS FOR SPARK RESISTANT CONSTRUCTION

## AMCA STANDARD

### 99-0401-86

Fan applications may involve the handling of potentially explosive or flammable particles, fumes or vapors. Such applications require careful consideration of all system components to insure the safe handling of such gas streams. This AMCA Standard deals only with the fan unit installed in that system. The Standard contains guidelines which are to be used by both the manufacturer and user as a means of establishing general methods of construction. The exact method of construction and choice of alloys is the responsibility of the manufacturer; however, the customer must accept both the type and design with full recognition of the potential hazard and the degree of protection required.

#### TYPE CONSTRUCTION

- A. All parts of the fan in contact with the air or gas being handled shall be made of nonferrous material. Steps must also be taken to assure that the impeller, bearings, and shaft are adequately attached and/or restrained to prevent a lateral or axial shift in these components.
- B. The fan shall have a nonferrous impeller and nonferrous ring about the opening through which the shaft passes. Ferrous hubs, shafts, and hardware are allowed provided construction is such that a shift of impeller or shaft will not permit two ferrous parts of the fan to rub or strike. Steps must also be taken to assure that the impeller, bearings, and shaft are adequately attached and/or restrained to prevent a lateral or axial shift in these components.
- C. The fan shall be so constructed that a shift of the impeller or shaft will not permit two ferrous parts of the fan to rub or strike.

#### Notes:

- 1. No bearings, drive components or electrical devices shall be placed in the air or gas stream unless they are constructed or enclosed in such a manner that failure of that component cannot ignite the surrounding gas stream.
- 2. The user shall electrically ground all fan parts.
- 3. For this Standard, nonferrous material shall be any material with less than 5% iron or any other material with demonstrated ability to be spark resistant.
- 4. The use of aluminum or aluminum alloys in the presence of steel which has been allowed to rust requires special consideration. Research by the U.S. Bureau of Mines and others has shown that aluminum impellers rubbing on rusty steel may cause high intensity sparking.

The use of the above Standard in no way implies a guarantee of safety for any level of spark resistance. "Spark resistant construction also does not protect against ignition of explosive gases caused by catastrophic failure or from any airstream material that may be present in a system."

#### This standard applies to:

Centrifugal Fans  
Axial and Propeller Fans  
Power Roof Ventilators

This Standard applies to ferrous and nonferrous metals. The potential questions which may be associated with fans constructed of FRP, PVC, or any other plastic compound were not addressed.