Hand Tools – Non-sparking tools – Fact Sheets



WHAT IS A "NON-SPARKING" TOOL?

"Non-sparking", "spark reduced", "spark-resistant" or "spark-proof" tools are names given to tools made of metals such as brass, bronze, Monel metal (copper-nickel alloy), copper-aluminum alloys (aluminum bronze), or copper-beryllium alloys (beryllium bronze).

Commonly used hand tools are often manufactured of steel alloys. Preferred "non-sparking" metals have less tensile strength than steels usually used to make tools. A lower tensile strength means the metal has less strength or resistance to tearing apart when stretched under test conditions. It also means that these tools are softer, wear down more quickly than ordinary steel tools, and have to be dressed more frequently.

What is the most important thing to know about "non-sparking" tools?

Non-sparking tools also generate sparks sometimes referred to as "cold sparks". These cold sparks have a low heat level and do not ignite carbon disulfide, which has the lowest ignition point of any substance known to man. Therefore while "non-sparking" tools may lower the risk of a spark, they do not eliminate the possibility of sparks. The name "non-sparking" is misleading because these tools are capable of producing a spark: the term "reduced-sparking tools" better describes these tools.

Non-metals like wood, leather, and plastic are suitable for some tools like shovels, scrapers or scoops and do not pose a friction spark hazard.

Non-sparking tools provide protection against fires and explosions in environments where there is a concern about sparks igniting flammable solvents, vapors, liquids, dusts or residues.

NOTE: It is important to assess each situation carefully and use the appropriate tools for the hazards that are present. In some cases, "non-sparking" tools may still be able to produce a spark. Contact the tool manufacturer, and the producer of the flammable material (for example) for recommendations and more information.

NOTE: It is also important to consider the metals used in the tools themselves. For example, beryllium has been associated with several health issues including cancer. While exposure to beryllium dust is likely very low with the general use of non-sparking tools, it may be a consideration grinding or polishing the tool itself.

What are the hazards of both “sparking” and “non-sparking” tools?

Both “sparking” and “non-sparking” materials can cause ignition. Two types of hazards are associated with tools manufactured of either material:

1. Ignition by friction, with impact on each other or on other materials such as steel or concrete, in which an “ordinary” (mechanical or frictional) spark is generated. All tools can ignite flammable mixtures by sparks generated by friction or impact. However, this is true only when the generated spark is incendive: that means a spark that has to have enough heat content (i.e., enough mass and sufficiently high temperature) and has to last long enough to heat a flammable air-vapour mixture above its ignition temperature. This is more likely in the case of sparks formed when using a metal grinder that a spark generated when a hammer strikes some metal.
2. Ignition by a chemically-generated spark, caused by impact between certain metals and some oxygen-containing substances (such as rust, which is iron oxide).

How should you use and maintain “non-sparking” tools?

Follow the guidelines below to reduce the risk of explosion and fire.

- Make sure all “non-sparking” tools are kept clean and free from ferrous or other contaminants, which may hamper the non-sparking properties.
- Select the right sized tool for the task (such as the wrench opening to the nut). The right fit will help prevent the tool from slipping, reducing the chance of a spark.
- Do not use non-sparking hand tools in direct contact with acetylene, which may form explosive acetylides, especially in the presence of moisture.
- Use local or mechanical ventilation systems as appropriate to remove hazardous materials, dusts and vapors from the workplace.
- Non-sparking tools will need to be redressed more often. Follow normal safety procedures when sharpening non-sparking tools such as the provision of eye and face protection, adequate extraction and dust collection facilities.

What is the best safeguard against incidental explosions?

Follow safe work procedures. Always evaluate a job to be done in any hazardous environment. Use proper tools and equipment that eliminate ignition such as electric motors that can be certified as “explosion proof” for use in most hazardous work locations or non-sparking tools with proper use and maintenance. Keep in mind that there are no truly non-sparking tools. In any work where flames are used, or sparks are produced, make sure that an explosive atmosphere does not develop. Such atmospheres include flammable vapour-air mixtures and organic dust clouds like flour or coal dust. Isolation, ventilation and purging are methods of insuring a safe working atmosphere. Use explosimeters in the workplace to protect those working in hazardous environments.

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