

POSITION STATEMENT

USE OF NONSPARKING TOOLS

Question

Are nonsparking tools required when working on flammable gas systems?

Answer

The use of nonsparking tools would depend on the specific circumstances. CGA recommends a risk assessment be conducted for specific tasks, locations, tools, and the type of flammable gas system, where working on a flammable gas system is an issue. A simple answer of yes or no is not possible given the many factors involved.

The term nonsparking tools can be misleading. While it's true these types of tools are generally less likely to induce a spark, they are not truly spark proof. Tools, even those traditionally thought of, or referred to, as non-sparking can in fact create sparks in the right circumstances. These nonsparking tools can generate sparks sometimes referred to as cold sparks. Cold sparks have a low heat level; therefore, while nonsparking tools can lower the risk of a spark, they do not eliminate the possibility of sparks. CGA prefers to refer to these as low ignition energy tools due to the nature of the low heat level spark they could produce if a spark was to occur. The characteristics of various low ignition energy tools further complicates the question and necessitates a risk assessment that not only assesses the potential for flammable gas, but also the task involved and the type of tool being used for what purpose.

Materials of construction commonly used in low ignition energy tools are nonferrous such as brass, bronze, Monel®, copper-beryllium alloys, and copper-aluminum alloys.

The following should be considered when developing a risk assessment for working on a flammable gas system:

- The term working on flammable gas systems is not specific enough to assess the risk and potential improved safety by using nonsparking tools. Working on a flammable gas system in and of itself does not pose an ignition risk if the system has been properly isolated and purged of flammable gases. Therefore, one should consider if there are actually flammable gases present, not just working on a flammable gas system;
- The amount of energy necessary to ignite a flammable gas varies from gas to gas. In some cases, such as hydrogen, so little energy is necessary to ignite it, that (for example) turning a packing nut to stop a leak could generate enough energy from the nut friction that an ignition could occur even if no spark was produced. In this case, a low ignition energy tool might not provide any additional safety. Similarly, everyday static generated by the worker can pose a risk of ignition that is more than that posed by the risk of a common steel wrench creating a spark when tightening fittings. Conversely, some gases have a higher ignition threshold that it is unlikely that a spark would ignite a leak, but this of course would also depend on the concentration of the gas present, so a low energy spark tool could provide some additional safety in these cases; and
- Tool material compatibility is of concern with low ignition energy tools. The copper content of these tools can make them incompatible for use in a particular gas service (for example, acetylene).

Summary

CGA believes the safest method of working on flammable gas systems is having them depressurized and inerted, in which case a low ignition energy tool (nonsparking tool) would not provide any additional safety over carbon steel tools. However, low ignition energy tools can provide an added level of safety when working on systems pressurized with flammable gas and when addressing leaking components. Due to the large variety of scenarios and variables, the use of low ignition energy tools should be addressed by conducting a specific risk assessment that considers:

- flammable gas characteristics (ignition energy required, amount present in the working area of the tool, etc.);

- task involved;
- type of tool required;
- tool material compatibility; and
- status of the system:
 - pressurized with flammable gas but gas contained and verified
 - leaking flammable gas repairs
 - system is depressurized or depressurized and inerted, etc.

NOTE—In many cases, low ignition energy tools can have less strength than high carbon steel tools and are more at risk of breaking during use.

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