



## THE USE OF PROTECTION METHODS IN ZONE 0

Our readers sent us numerous requests regarding the fact that “Ex d”, “Ex e”, “Ex p”, “Ex o”, “Ex q” equipment cannot be used in Zone 0. Therefore, we try to understand what are the normative limits and the reasons for these choices which, as we’ll see, should be reconsidered.

There’s a general agreement that the security level of “Ex d”, “Ex e”, “Ex p”, “Ex o”, “Ex q” types of protection is not high enough compared to the probability that an explosive mixture is present in Zone 0.

As we know, the areas classification in Europe and, also according to the IEC Standard, is a statistical fact: it compares the average of the number of hours in presence of the explosive mixture in the course of a year and the level of equipment protection.

The Zone 0 for gases, vapors and mists is an area in which the presence of the explosive mixture is more than 100 hours / year.

As already explained in the newsletters of previous months, a Zone 0 is, for example, the inside of a tanks, where the presence of gas and, therefore, the explosive mixture is present continuously throughout the year.

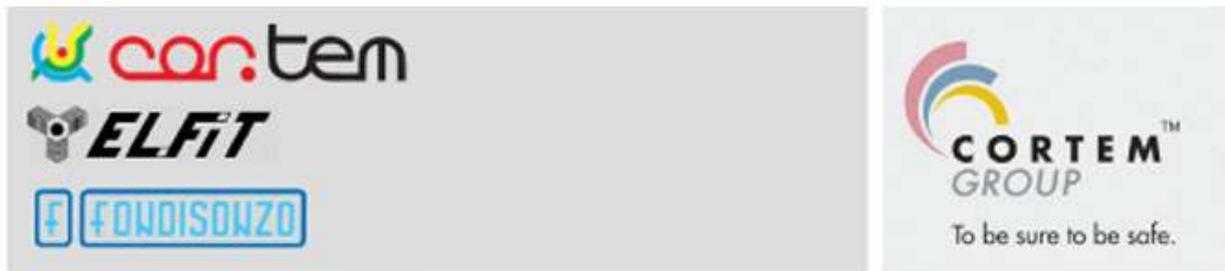
According to the IEC 60079-14 (EN 60079-14) only the types of protection “Ex ia” and “Ex ma” have a sufficient level of safety for the use in Zone 0. Otherwise, sometimes is accepted a combination of two independent types of protection (e.g. “Ex d” enclosure with inside “Ex ib” circuits), which together ensure a sufficient level of safety for Zone 0.

However, in North America, following the NFPA 70, NEC Article 500, under the division system, there is no difference in the equivalent of European Zone 0 and 1. This Standard has only two American divisions that we can simplify as follows:

STANDARD	HAZARDOUS AREAS CLASSIFICATION		
	DIVISION 1		DIVISION 2
North America (NEC 500)	DIVISION 1		DIVISION 2
Europe (EN 60079-10-1)	ZONE 0	ZONE 1	ZONE 2
IEC (IEC 60079-10-1)	ZONE 0	ZONE 1	ZONE 2
North America (NEC 505)	ZONE 0	ZONE 1	ZONE 2

The equipment built for the IEC Zone 1 can be used in Division 1 which, as you can see in the table, includes also the European Zone 0.

Only for a historical reference, we bring to mind that in the ‘60 IEC also had only 2 and not 3 zones.



You should keep in mind that the safety concepts still in use, on which are based the principles of hazardous areas division and of protection methods, are based on research, testing and tests developed about 50 years ago. These studies were based on design techniques, production control and quality levels at that time.

Today, equipment can be produced much better than 50 years ago with a much higher level of security.

In principle, many types of protection designed for Zone 1 could also be used in Zone 0. This approach, however, is not accepted or even considered in the rules issued by the Technical Committee of IEC TC31.

It's fairly widespread opinion that the requirements for equipment that exist in today's technical standards should be reevaluated in light of current technology. We'll see that equipment designed with protection method today not allowed in Zone 0, with appropriate additional requirements, may be absolutely safe.