

# Risk assessment according to the ATEX Directive

**Risk assessment must be performed in accordance with the requirements of EN 1127-1. The standard is intended to be applied to any equipment, protective systems or components intended for use in potentially explosive atmospheres under atmospheric conditions. This requirement applies only for Group II equipment.**

The requirements in EN 60079-0 are the result of generic risk assessment of electrical equipment. Risk assessment is therefore not usually required for electrical equipment.

The explosion-protected design is based on the manufacturer's risk assessment (source of ignition analysis). The following describes the principles of analysis that apply for non-electrical equipment in accordance with EN 13463-1. (General principles can be found in EN 15198)

### Preventive and protective measures

If prevention of explosive atmospheres is not possible, preventive and protective measures (type of protection) shall be considered in the following order:

1. Ensure that ignition sources cannot arise;
2. Ensure that ignition sources cannot become effective;
3. Prevent explosive atmosphere reaching the ignition source;
4. Contain the explosion within the equipment or component and prevent flame propagation and/or reduce the effect of the explosion to an acceptable level. (e.g. Explosion venting devices)

### Risk assessment

Risk assessment (Ignition Hazard Assessment) involves systematic analysis of the equipment in terms of the ignition risk of potentially explosive mixtures of gas or dust in air.



The following shall be identified and recorded in a risk assessment report:

- Potential sources of ignition
- Protective measures
- Verification of protection (standards etc.)

### Standards

EN 13463-1 specifies requirements for a formalised and documented risk assessment. The assessment considers the occurrence of sources of ignition during normal operation, in the event of a foreseeable malfunction, and in the event of a rare malfunction, depending on the equipment's category as shown below. The standard describes and gives examples of risk assessment. Further examples of risk assessment can be found in EN 13463-5.

| Equipment category | Source of ignition must not occur in ... | Zone        |
|--------------------|--|-------------|
| 1                  | Rare malfunction                         | 0-2 (20-22) |
| 2                  | Expected malfunction                     | 1-2 (21-22) |
| 3                  | Normal operation                         | 2 (22)      |

EN 13463-1 defines normal operation, expected malfunctions and rare malfunctions.

Different types of sources of ignition are described in EN 1127-1 (Group II) and in EN 1127-2 (Group I).

### **Examples of sources of ignition**

Hot surfaces, mechanically generated sparks, electrostatic discharge, compression, electromagnetic radiation and optical radiation.

### **Sources of ignition in 'normal operation'**

The following situations must also be considered when identifying sources of ignition in normal operation:

- maintenance and cleaning
- start-up, stopping and disconnection
- malfunctions / operational problems that can occur
- incorrect use that can reasonably be foreseen
- foreseeable environmental conditions
- foreseeable overloading

### **Ignition Hazard Assessment Report (IHAR)**

An Ignition Hazard Assessment Report can include the following:

#### *1. Description of the product*

Type designation, Ex classification etc.

#### *2. Intended use*

Function, intended use, intended Ex environments etc.

#### *3. Risk assessment regarding ignition sources*

Summary of ignition sources and protection, references to annexes with risk assessment table and specification of CE-marked ATEX equipment etc. that is incorporated.

#### *4. Marking of explosion protection*

Marking in accordance with the ATEX Directive and applicable standards.

#### *5. Archiving of the report*

Report / file number, archiving location etc.

If the product includes equipment that is already CE-marked under the ATEX product directive, the assessment must include inspection to ensure that the equipment is correctly installed and used. This inspection must include correct use of the equipment in accordance with its marking, instructions for its use and, for certified equipment, compliance with any special conditions defined in applicable certificate.

All such CE-marked equipment must also be accompanied by an EC Declaration of Conformity with the ATEX Directive.



### **Contact persons**

Thomas Berg  
Thomas.berg@sp.se  
+46 10 516 54 04

Peter Bremer  
Peter.bremer@sp.se  
+46 10 516 54 05

Robert Carlsson  
Robert.carlsson@sp.se  
+46 10 516 57 15

Marjan Shishehchian  
Marjan.shishehchian@sp.se  
+46 10 516 52 87