



## Fact Sheet No.2

### CompEx Modules EX01 to EX04 for Gas and Vapour Environments

#### Module Breakdown

**EX01:** The preparation & installation of Ex 'd', 'n', 'e' and 'p' equipment in potentially explosive atmospheres.

**EX02:** The maintenance and inspection of Ex 'd', 'n', 'e' and 'p' equipment in potentially explosive atmospheres.

**EX03:** The preparation & installation of Ex 'i' equipment in potentially explosive atmospheres.

**EX04:** The maintenance and inspection of Ex 'i' equipment in potentially explosive atmospheres.

#### Location

Exveritas Training Centre (Wrexham) or Exveritas/Jones Engineering Services Training Centre in Little Island, Cork.

#### Course Duration

5 days

#### Examined

Yes (practical and theoretical). Please note the theoretical examination is on-line. Lap tops will be provided for the duration of the examination.

#### Certificate issue

Yes (Certificate of Core competency)<sup>1</sup>

#### Audience

Practitioners; for those with a practical background, the course may also be beneficial to maintenance engineers, project engineers wishing to gain a practical understanding of the subject.

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<sup>1</sup> Certificate will list the assessments the candidate has been successful in. Full certification is issued provided the candidate can demonstrate base line competency through existing training and qualifications supplemented by an employer's letter of endorsement.

## Course Overview

The course is intended to give awareness to the candidate with regard to working in explosive atmospheres formed by gases, vapours & mists. It covers basic elements of application design as well as a more detailed review of the specific requirement for equipment selection, installation, inspection and maintenance of electrical installations in explosive atmospheres. The course will give an understanding and awareness of the requirements of working safely in a potentially explosive atmosphere. The course covers elements of the installation requirements from a practical viewpoint. This includes but not limited to electrical protection concepts, selection of equipment, cabling and cable glands etc. For the inspection module then a review of a typical electrical and intrinsically safe installation is also covered.

All presentation material is in Microsoft PowerPoint, whilst electronic (hard copies are available at cost) hand-outs are available in either PowerPoint (three slides per page) some of the presentations are available in word documentation format. The format of the course notes are intended that they can be used as an aide-memoir tool in the future for the candidate. Course delivery and all assessment material (instruction as well as exam papers) are currently in English.

## Course Agenda

### Health & Safety

Introduction to safe working in explosive atmospheres

### Legal Aspects

Health and safety legislation for working in explosive atmosphere.

### Explosive Atmospheres

Introduction into the subject including definition of the three groups, gas/vapour or dust subdivisions, surface temperatures, temperature classes, density of gases and vapours, flammable range and explosive range ambient temperatures, minimum Ignition Energy (MIE), Maximum Experimental Safe Gaps (MESG), etc

## **Area Classification**

Understanding of the basic requirements of area classification, i.e. IEC 60079-10-1 gases and vapours grading sources of release i.e. continuous, primary or secondary, zone types etc.

## **ATEX Directive 2014/34/EU (was 94/9/EC- Equipment)**

A detail review of what the equipment marking on different types of equipment means:e.g. ATEX and CENELEC marking schemes.

## **Equipment Protection Levels (EPL)**

Overview of the IEC Equipment Protection Levels for explosive atmospheres e.g. Ga, Gb, Gc

## **Protection Concepts**

An overview of the concepts as applied to equipment for use in explosive atmospheres e.g.

Electrical concepts - d, e, m, n, o, p, q and i;

Principals of how the electrical concepts works;

Intrinsic safety;

I.S. cable types, an overview;

Earthing Systems

## **International (Ingress) Protection**

Introduction and explanation of the terminology used for equipment with regard to the latest edition of international (ingress protection) reference IEC 60529 e.g. IP54 or IP67, which is the best and why.

## **Cables and Glands**

Identifies what cable types and cable glands types are suitable for use with which protection concept. Detailed review of cables and cable gland such as A1, A2, CW, CX , E1 cable glands, barrier compound glands etc. Covers a practical element on the preparation and making off cable glands

## **Installation practices for equipment installed in gas/vapours environments**

Review of the requirements latest edition of IEC 60079-14 with regard to the installation of both electrical and intrinsically safe installations in explosive atmospheres.

## **Inspection and Maintenance for equipment installed in gases/vapours**

Review of the requirements of latest edition of IEC 60079-17 with regard to the inspection and maintenance of electrical and intrinsically safe installations in explosive atmospheres.

## **Understanding of the additional importance of permit to work systems and safe isolation in relation to explosion protection.**

Re-enforces attitudes and work processes in relation to working in a potentially explosive atmosphere.

## **Course Agenda**

1. Health and Safety
2. Explosive atmospheres
3. Area Classification
4. Ingress Protection
5. ATEX 94/9/EC- Equipment and equipment marking.
6. Equipment Protection Levels.
7. Cables
8. Cable Glands
9. Installation Practices (Electrical and I.S. concepts )
10. Inspection Practices and guidance.

## **Assessments**

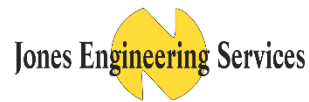
Candidates are required to undertake a series of practical assessments. These assessments are divided into four to cover modules EX01 to EX04. A time limit is set against each assessment as this is designed to simulate the pressures that can be encountered in the work place. In addition to the above practical assessments a candidate's knowledge is assessed by undertaking a multi-choice examination. On completion of the course certification will be awarded based on candidates passing both the practical and theoretical parts of the assessments.

## **Candidate Pre-Qualifications**

It is a pre-requisite requirement of the course that candidates are able to demonstrate their underpinning knowledge and training as an "electro-technical" craftsperson. There is a recognised route for this within the UK through apprenticeships, national vocational qualifications (NVQ), specific training courses, etc.



Candidates outside of the UK attending a course are encouraged to start some form of dialogue with ExVeritas/Jones Engineering Services as early as possible in order to ensure that their local, national or company scheme meets the criteria set by CompEx. To aid in this process CompEx have introduced a letter of endorsement (Employees/Sponsorship letter) that must be completed and signed by the employer.



## **COMPEX TRAINING CENTRES**

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