



Hazardous Location Fundamentals Online Course Overview

Course Objective: To provide a general understanding of hazardous location as they apply to Canadian Installations

Intended Audience: Engineers, Designers, Installers, Inspectors and Maintenance Personnel responsible for the specification, design, installation, and inspection of equipment installed in hazardous locations

1. Introduction to Hazardous Locations

- a. Hazardous Locations (Flammable Gases)
 - i. Fire Triangle
 - ii. Properties of flammable gases/vapours
 - iii. Combustible dust hazards

2. Classification of Hazardous Locations

- a. Zone – Division Classifications
- b. Group Classification
- c. Auto-ignition temperature and temperature codes
- d. Documentation requirements

3. Hazardous location Protection

Concepts

- a. Equipment Protection Level (EPL) concepts
- b. Safe by design
- c. Explosion containment
- d. Segregation
- e. Energy Limitation

4. HazLoc Product Certification

Requirements

- a. Definition of “approved” as per CE Code
- b. HazLoc Product standards
- c. Certification marks
 - i. Product certifications
 - ii. Field evaluation
 - iii. Field Certification
- d. Querying a certification listing
- e. Field modifications of approved equipment

5. Explosionproof and Flameproof Ex d Protection

- a. Equipment markings
- b. Installation considerations

6. Ex e Increased Safety

- a. Equipment markings
- b. Installation considerations

7. Ex i Intrinsic Safety

- a. Intrinsic safety concepts
- b. Simple vs. complex device
- c. Equipment markings



- d. IS circuit documentation requirements
- e. Installation considerations

8. Type n protection – Non-incendive

- a. Type n protection concepts
- b. Equipment markings

9. Ex p Pressurization

- a. Ex p product standards
- b. Pressurization schemes
- c. Equipment markings

10. Ex t Protection by enclosure

- a. Product standards
- b. NEMA and IP Enclosure ratings
- c. Equipment markings

11. Other methods of protection

- a. Ex o – Liquid immersion
- b. Ex q Sand Filled
- c. Ex m – encapsulation
- d. Combination markings

12. Ex op Optical Radiation

- a. Optical radiation as an ignition source
- b. Product markings

13. Combustible gas detection

- a. CGD as a method of protection
- b. Installation guidelines
- c. Calibration and maintenance

14. Other electrical apparatus

- a. Definition of “other electrical apparatus”
- b. Application

15. Reading a Hazloc Product Label

- a. Determining the applicable product markings
- b. Interpreting Division markings
- c. Interpreting IEC Zone markings
- d. Ambient temperature limitations
- e. Conditions of use

16. HazLoc Product Assessment

- a. CE Code Table 18
- b. Information required to make an assessment
- c. Division equipment in Zone classified facilities
- d. Zone equipment in Division classified facilities

17. Hazardous Location wiring methods

- a. CE Code requirements
- b. Conduit vs. cable requirements
- c. Installation considerations

18. Sealing in hazardous locations

- a. Explosion seals
- b. Fluid migration seals
- c. Process sealing requirements

19. Course Review

- 20. Exam** - Course certificate will be issued upon exam completion