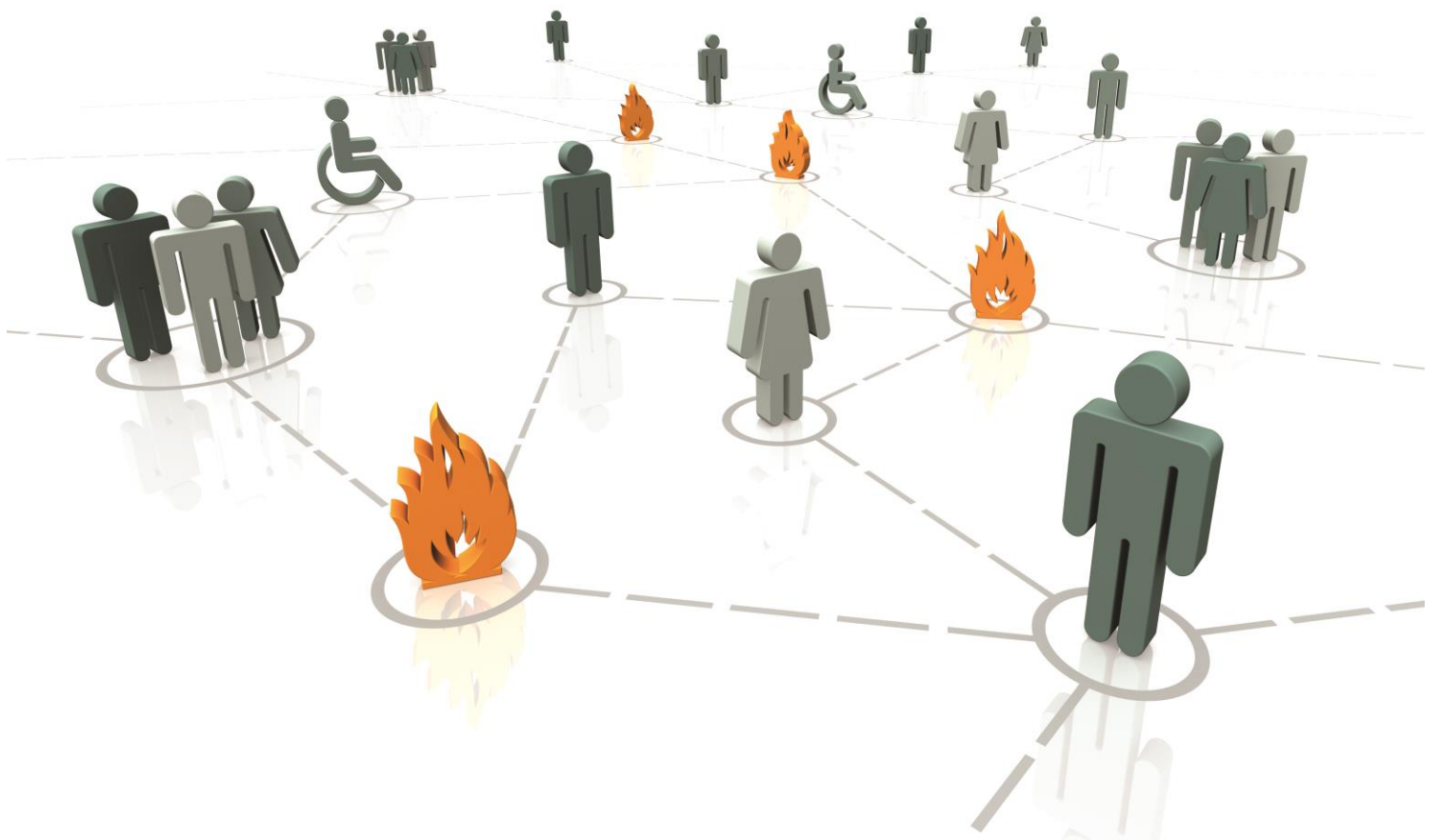


# Level 5 Diploma in Fire Engineering Design



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## 1. Introduction

### 1.1 Introduction

This document is designed to help individuals and organisations inform their training decisions by presenting our courses, their content, costs and flexible delivery methods to complete qualification.

### 1.2 Qualification: Level 5 Diploma in Fire Engineering Design

This document identifies activities learners need to complete to achieve this qualification. For details, see Section 4.

### 1.3 Target audience

The qualification is aimed at building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, risk assessors, managers, surveyors and fire safety professionals.

It enhances previous experience in applying fire safety guidance such as Approved Document B and BS 9999 fire safety in design, management and use of buildings.

**Note:** Individuals must demonstrate their suitability for attending the above courses.

### 1.4 Qualification activities

The following courses and self-study module are required to achieve the qualification:

- a) Fire Engineering Design 1: 5-day course
- b) Fire Engineering Design 2: 5-day course
- c) Fire Engineering Design 3: 5-day course
- d) Fire Engineering Design 4: Self-study module

**Note:** For more details, please see Section 2.

### 1.5 NFCC Competency Framework for Fire Safety Regulators

This qualification is part of the knowledge and skills competency requirements for a Fire Engineering Design Technician, an individual who can review building control consultations including complex premises submissions and provide guidance to Fire Safety Regulators for complex premises. This group may audit buildings based upon fire engineering principles while being aware of the scope of their competency and prepared to request appropriate assistance where necessary.

## 1. Introduction

National Fire Chiefs Council (NFCC) competency framework for fire safety professionals recommends that national qualifications are completed sequentially i.e. they complete a Level 4 Diploma in Fire Safety (or its equivalent) before Level 5 Diploma qualification.

**Note:** See Section 4 for more details about study commitment.

### 1.6 Entry requirements

Learners must:

- a) have ability to work at Level 5 or above
- b) be proficient in use of English Language
- c) be able to carry out mathematical calculations e.g. area and volume of cylinders and rectangular structures, formulas, equations
- d) Have previous experience applying BS 9999 or equivalent
- e) Have time necessary for study programme
- f) Have access to resources to conduct research

### 1.7 Continual Professional Development Certificates

Learners receive CPD certificates on successful completion of each course or activity.

### 1.8 Further Progression

This qualification creates the opportunity for progression to a fire engineering degree.

### 1.9 Course booking

**Open-course booking:** Click for [on-line booking](#)

**In-house course enquiry<sup>1</sup>:** Email: [qualifications@xact.org.uk](mailto:qualifications@xact.org.uk)

**Note<sup>1</sup>:** Quoting qualification, learner numbers and preferred start date

### 1.10 Terms and conditions

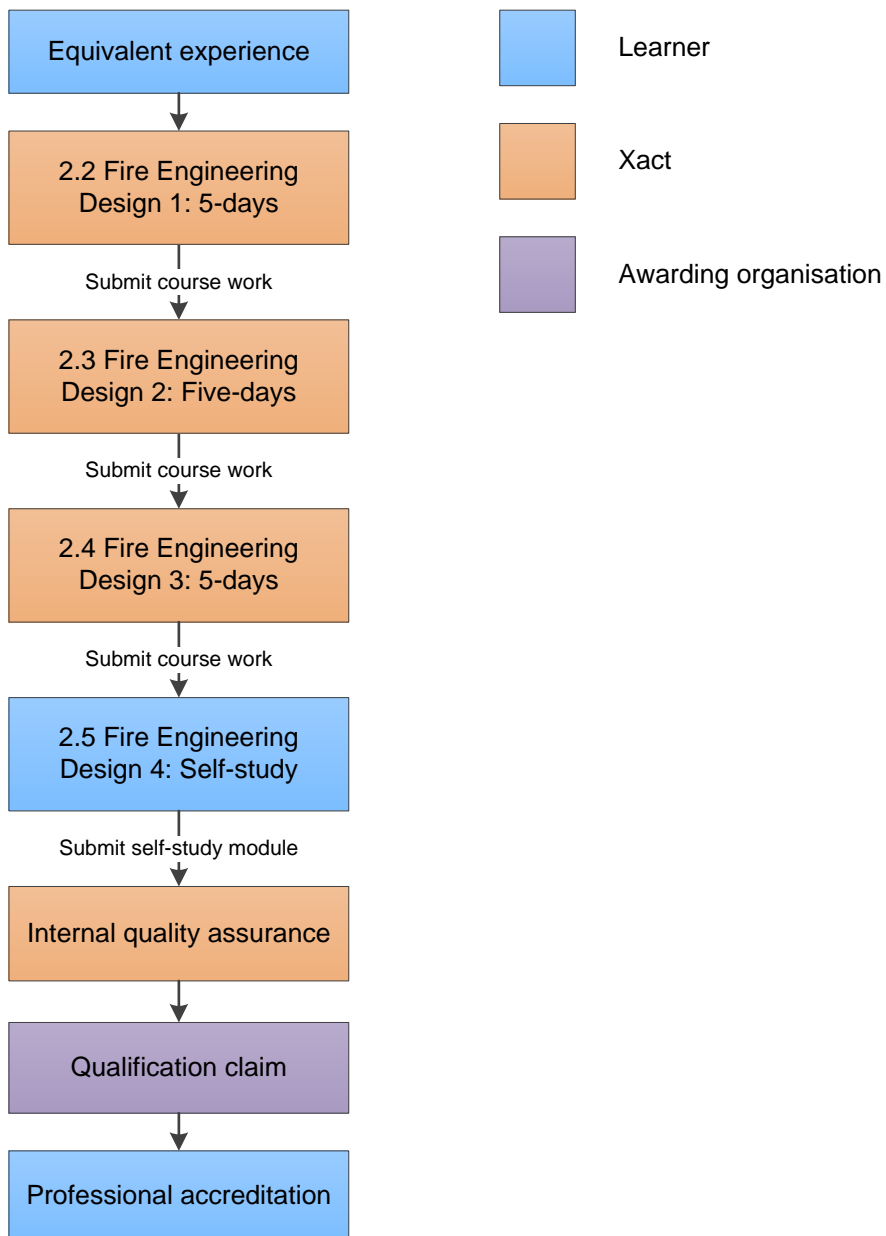
Please also see our [website link](#) for a copy of our Terms and Conditions.

All orders and bookings made are subject to our Terms and Conditions.

## 2.1 Level 5 Diploma in Fire Engineering Design Overview

### 2.1.1 Introduction

Flowchart below illustrates progression of activities to complete Level 5 Diploma in Fire Engineering Design from start to finish.



### 2.1.2 Study

This qualification requires significant reading and self-study. For more details, see Section 4

### 2.1.3 Delivery

Sessions are delivered virtually (iVC) using PowerPoint, whiteboard presentation, interactive group discussion, individual tuition and practical exercises.

Courses will be delivered face-to-face should demand return

### 2.1.4 Post course

Learners must submit their completed workbooks within six<sup>1</sup> weeks of course completion.

**Note**<sup>1</sup>: Except self-study module Fire Engineering Design 4 which is four weeks.

### 2.1.5 Course assessment

Assessment of all course<sup>1</sup> work is to qualification assessment criteria. See Section 4.5.

**Note**<sup>1</sup>: Evidence from more than one course is required to complete qualification assessment criteria.

## 2.2 Fire Engineering Design 1

### Aim

To enable learners to review the effectiveness of automatic fire suppression systems

### Core content

In-depth study and research into:

- Principles of automatic fire suppression systems
- Residential and domestic sprinklers: BS 9251
- Residential water mist systems: NFPA 750, BS 8458
- Commercial sprinklers: BS EN 12845
- LPC Sprinkler rules and ESFR: Early Suppression Fast Response Fire Sprinkler Systems
- Hazard review of commercial sprinkler systems
- Commercial water mist systems: NFPA 750, BS 8489
- Oxygen Reduction Fire Prevention Systems: BS EN 16750
- Gaseous and foam systems: BS EN 1365-9: Foam systems
- Case studies of Automatic Fire Suppression Systems

### Duration

Five-days

### Prior learning

This course is part of a qualification to enable attendees to develop an understanding of fire engineering at technician level. It is a natural progression from achieving qualification: Level 4 Diploma in Fire Safety (Fire Inspectors) or an equivalent qualification or experience.

Learners must have an in-depth working knowledge of the functional requirements of the building regulations and fire safety guidance documents such as Approved Document B, Volume 2 and BS 9999 fire safety in the design, management and use of buildings.

**Note** Learners must demonstrate their suitability for attending this course. See Section 4 for more details.

## 2.3 Fire Engineering Design 2

### **Aim**

To enable learners to:

- Understand principles of fire engineering design
- Understand impact of fire engineering design on human behaviour
- Review smoke control and heat exhaust ventilation systems

### **Core content**

In-depth study and research into:

- BS 7974 Application of fire engineering principles
- Tenability principles
- Principles of smoke obscuration/visibility
- Human behaviour in fire
- QDR: Qualitative Design Review
- Fire engineering design and consultations
- Probabilistic risk assessment
- Business impact assessment
- ASET – RSET timelines
- Fire Safety management and control procedures
- Interactions between fire safety systems
- Design fires and radiation shape factors
- SHEVS: Smoke and heat exhaust ventilation systems
- Commissioning, testing and maintenance programmes

### **Duration**

Five-days

### **Prior learning**

Learners must have completed course: Fire Engineering Design 1.



# 2.4 Fire Engineering Design 3

### **Aim**

To enable learners to:

- Understand impact of fire engineering design on fire resistance of materials and structures
- Review impact of fire engineering design on external spread of fire
- Review impact of fire engineering design on access and facilities for fire-fighting
- Review pressure differential systems
- Understand principles of fire and evacuation modelling

### **Core content**

- BS 7974 Application of fire engineering principles
- Radiation shape factors
- Applying fire engineering to the functional requirements of the building regulations:
  - B2: Internal fire spread (linings)
  - B3: Internal fire spread (structure)
  - B4: External fire spread
  - B5: Access and facilities for FRS
- Series and parallel pressure differential systems
- Principles of fire and evacuation modelling

### **Duration**

Five-days

### **Prior learning**

Learners must have completed course: Fire Engineering Design 2.

## 2.5 Fire Engineering Design 4

### **Aim**

For learners to apply principles fire engineering to the development of fire and spread in a building.

### **Self-study**

This module requires learners to conduct research and self-study into fire development and spread and apply them to a practical scenario.

### **Duration**

Self-study

### **Prior learning**

Learners must have completed course: Fire Engineering Design 3.

### **Post course**

Learners must complete self-study module within four weeks of issue.

## 3. Costs

## 3. Open course costs

Item	Activity	Duration	Page	Cost <sup>1, 2</sup>
1	Fire Engineering Design 1	5-days	5	1,015
2	Fire Engineering Design 2	5-days	6	1,015
3	Fire Engineering Design 3	5-days	7	1,015
4	Fire Engineering Design 4	Self-study	8	120
5	Qualification registration <sup>3</sup>	NA	10	125
6	<b>Inclusive cost<sup>4</sup> per learner</b>			<b>£3,290</b>

**Note<sup>1</sup>:** VAT will be added at the current rate. See Notes 5 and 6

**Note<sup>2</sup>:** **IT Resources:** Costs based on assumption that learners have resources identified in Section 6.1 iVC Individual Requirements. See also 6.4 Restrictions to using iVC software.

**Note<sup>3</sup>:** Including internal quality assurance fees

**Note<sup>4</sup>:** **Inclusive cost:** Includes all elements necessary to complete activity e.g. Course development, design, course documents, self-study modules, postage, assessments, internal quality assurance and qualification fee.

**Note<sup>5</sup>:** **Payment terms:** Within 30 days of invoice date.

**Note<sup>6</sup>:** Additional fees are incurred when:

- i) Submission deadlines are missed for invalid reasons
- ii) Re-submission amounts to over 25% of original submission
- iii) Re-submission does not achieve a pass

## 4. Qualification

### 4.1 Qualification: Level 5 Diploma in Fire Engineering Design

This qualification is for individuals who work or intend to work in a position where they are involved in auditing or risk assessing fire engineering premises and designing or assessing fire engineering design submissions.

The Diploma in Fire Engineering Design is a Level 5 qualification aimed at building control officers, approved inspectors, fire engineers, fire safety auditors, inspectors, fire risk assessors, managers, surveyors, architects and fire safety professionals so that they can work towards achieving Fire Engineering Technician status.

The qualification provides individuals with a practical understanding of fundamental engineering principles, enabling them to identify proven techniques and procedures to solve practical fire engineering problems and, when appropriate, to hand over to a fire engineer.

### 4.2 Pre-entry Requirements

There are no formal entry requirements although learners should be aged 19 years and over, able to work at Level 5 or above, be proficient in use of English Language and have previous experience of applying fire safety guidance such as Approved Document B (or equivalent) and BS 9999.

### 4.3 Qualification Awarding Organisations

Currently this qualification is provided via awarding organisation<sup>1</sup> Skills for Justice Awards. Xact is an Approved Centre for this awarding organisation.

**Note**<sup>1</sup>: Xact may change awarding organisations for business reasons

### 4.4 Qualification Structure

This qualification consists of 10 units which have been designed to provide learners with knowledge, understanding and skills to identify proven techniques and procedures to solve practical fire engineering problems and, when appropriate, to hand over to a fire engineer.

To achieve this qualification, learners must successfully complete all 10 mandatory units shown in the following section.

## 4. Qualification

### 4.5 Qualification Units

The qualification has ten mandatory units:

NOS	Unit title	Credit	TQT <sup>1</sup>	GLH <sup>2</sup>
1	Principles of Fire Development and Spread	2	20	10
2	Principles of Fire Engineering	6	60	40
3	Review the Effectiveness of Automatic Fire Suppression Systems	7	70	50
4	Fire Engineering Design and its Impact on Human Behaviour	3	30	20
5	Fire Engineering Design and its Impact on the Fire Resistance of Materials and Structures	3	25	20
6	Smoke Control and Heat Exhaust Ventilation Systems	6	60	30
7	Pressure Differential Systems	5	45	30
8	Fire Engineering Design and its Impact on the External Spread of Fire	2	20	10
9	Fire Engineering Design and its Impact on Access and Facilities for Fire-Fighting	2	20	10
10	Principles of Fire and Evacuation Modelling	2	20	10
			370	230

**Note<sup>1</sup>:** Total qualification time (TQT): GLH plus number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment.

**Note<sup>2</sup>:** Guided learning hours (GLH): The number of hours with specific guidance towards learning.

### 4.6 Qualification requirement

Learners should note that significant reading and self-study is required to achieve this qualification which requires learners to develop their awareness and understanding of an extensive range of industry-specific regulations, standards and documents as well as developing underpinning understanding of relevant scientific and engineering principles.

### 4.7 Study commitment

To complete this qualification learners are committing to a programme of study of 370 TQT (Total Qualification Time) which consists of a wide variety of activities, including:

- a) Attending courses
- b) Self-study and research:
  - i) Reading course reference material
  - ii) Researching papers, academic journals, alternative sources
  - iii) Viewing online videos
- c) Application of learning and writing assignments

**Note:** Diploma programme consists of 105 hours attending courses with remainder being from self-study, research, application of learning and written assignments.

## 4. Qualification

### 4.7.1 Learning agreement

To ensure learners and their organisations understand the commitment required for the Level 5 qualification, Xact invites them to enter into a learning agreement.

Each individual is required to return a copy of the learning agreement to Xact, signed by both them and their sponsoring organisation.

### 4.8 Cross mapping of activities with qualification units

The table below cross maps activities with qualification units

Activity title	Duration	Unit	Page
Fire Engineering Design 1	5-days	3	5
Fire Engineering Design 2	5-days	2, 4, 6	6
Fire Engineering Design 3	5-days	5, 7, 8, 9, 10	7
Fire Engineering Design 4	SS	1	8

### 4.9 Qualification requirements

Government regulator Ofqual provides the following guidance on the requirements for learners to demonstrate that they possess the following knowledge for a Level 5 qualification:

#### 4.9.1 Knowledge requirement

- a) Practical, theoretical or technological knowledge and understanding of a subject or field of work to find ways forward in broadly defined, complex contexts.
- b) Ability to analyse, interpret and evaluate relevant information, concepts and ideas.
- c) Awareness of the nature and scope of the area of study or work.
- d) Informed awareness of different perspectives or approaches within area of study or work.
- e) Ability to understand different perspectives, approaches or schools of thought and the reasoning behind them.

## 4. Qualification

### 4.9.2 Skills requirement

- a) Determine, adapt and use appropriate methods, cognitive and practical skills to address broadly defined, complex problems.
- b) Use relevant research or development to inform actions.
- c) Evaluate actions, methods and results.

### 4.10 Professional Accreditation

Professional accreditation routes are available to those who achieve the Level 5 Diploma in Fire Engineering Design:

#### 4.10.1 Engineering Technician (EngTech)

Engineering Technicians (EngTech) apply safe systems of work and contribute to either the design, development, manufacture, commissioning, decommissioning, operation or maintenance of products, equipment, processes or services.

For information about Engineering Technician (EngTech) see:

[Fire Engineering Council](#)

[Chartered Association of Building Engineers](#)

[Institution of Fire Engineers](#)

#### 4.10.2 Incorporated Engineer (IEng)

Incorporated Engineers (IEng) maintain and manage applications of current and developing technology and may undertake engineering design, development, manufacture, construction and operation (see Engineering Council website).

To achieve professional accreditation as an Incorporated Engineer, individuals will also need to demonstrate that they have achieved maths at an advanced level e.g. a maths degree.

For information about Incorporated Engineer (IEng) see:

[Fire Engineering Council](#)

[Chartered Association of Building Engineers](#)

[Institution of Fire Engineers](#)

## 5. Support Activities

### 5.1 Introduction

The support we provide to learners forms part of our regulated activities. This means that flexibility in what we can provide is limited by awarding organisations and Government Regulators i.e. Ofqual.

This section explains the support we offer to learners beyond that which is provided during courses and outlines their responsibilities to enable us to support them during learning.

### 5.2 Learner Support

Additional support may take the form of<sup>1</sup>:

- a) Reasonable Adjustments
- b) Special Considerations
- c) Learner Support

**Note<sup>1</sup>**: See our [website](#) for more details

### 5.3 Learner Responsibilities<sup>1</sup>

Responsibilities include:

- a) Ensuring they have ability to work at Level 4. For more details, see Section 4.6
- b) Allocating sufficient time to complete course work within set timeframes
- c) Building a support network for mentoring during learning
- d) Having facility to conduct a building audit. See Section 2.5
- e) Submitting course work within prescribed format and timeframes
- f) Providing appropriate evidence when applying for reasonable adjustments, special considerations, learning support etc

**Note<sup>1</sup>**: When an employer is involved, it is their responsibility to support their employees and provide them with opportunity to practise learning and conduct a building audit



### 6. iVC Interactive Virtual Classroom

#### 6.1 iVC Individual Requirements

Learners require the following to participate in iVC:

- Laptop: Integral web camera, microphone, speakers or equivalent
- Internet connection
- Ability to receive course notes by post directly to home address or posted to work address from where notes can be forwarded to home address

#### 6.2 iVC Delivery

iVC means learners can access Xact's high quality training safely and securely while enjoying real-time, face-to-face contact with expert tutors.

Highly trained in our innovative format, tutors facilitate interactive learning which actively engages the learners from the safety and convenience of their own preferred locations.

With **iVC**, customers save on accommodation and travelling fees while ensuring that learners can train from home, if necessary. And it is family friendly too - welcomed by employees who prefer not to stay away from their own locations overnight to receive training.

Customers who experience **iVC** training courses are impressed with the polished, professional presentation and how easy it is to:

- a) View and interact with expert tutors and other course attendees
- b) Ask questions, discuss and share ideas
- c) Work in syndicates
- d) Enjoy enhanced learning via video, PowerPoint, virtual reality exercises

#### 6.3 iVC Provision

On all **iVC** courses, Xact provides:

- a) Two tutors with experience and expertise in course subject areas
- b) Course design
- c) Comprehensive course manuals
- d) Exercises to practise learning outcomes
- e) Reference documents
- f) Course evaluation and assessment

## 6. iVC Interactive Virtual Classroom



### 6.4 Restrictions to using iVC software:

Common restrictions to using iVC software:

- a) Poor broadband connection
- b) VPN connections restrict video and audio. software may not function unless VPN is disabled
- c) Some company systems are locked down preventing access. Either request that your IT department lifts the restriction on your device to access software or use an alternative unrestricted device

### 6.5 iVC Software Security

Download details about the [security](#) measures imbedded in our iVC software.

### 7. XLE: On-line Portal

#### **7.1 XLE: Xact Learning Environment**

A secure area of Xact's website built on Moodle educational platform used by schools, colleges and universities which gives customers and users access to:

#### **7.2 Guidance Notes**

Such as educational process, responding to questions, related policies and procedures.

#### **7.3 Course reference documents**

Some reference documents used on courses are provided either online or within course folder.

#### **7.4 Submission deadlines**

On-line calendar detailing deadlines.

#### **7.5 Electronic submissions**

All activity is submitted electronically online, enabling learners to upload course work using electronic formats e.g. word and pdf.

All work submitted must be learners own work. This will ensure they are able to demonstrate their competence to the qualification assessment criteria.

Learners using another's work must reference it appropriately.

#### **7.6 Similarity check**

Turnitin software is used to check submitted documents for originality using its database containing fire safety guidance and legislation, previous submissions and content of other websites with the aim of identifying plagiarism. This facility, which is used by colleges and universities, is applied to all submissions.

#### **7.7 Assessor Reports**

Assessor reports and feedback are available on the XLE portal.

## 8. Company Details

### Company

Company Xact Consultancy and Training Limited  
Address 3 Abbey Lane Court, Evesham, Worcestershire WR11 4BY  
VAT Registration No 855 4570 04  
Phone 01386 277980  
Email [qualifications@xact.org.uk](mailto:qualifications@xact.org.uk)  
Web site [www.xact.org.uk](http://www.xact.org.uk)

### Insurance

Insurances we have include  
Public and Employers Liability  
Professional Indemnity

### Regulation

Organisations who regulate our activities include  
Ofqual, Ofsted, DfE, Awarding organisations