

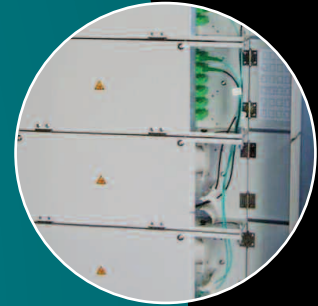
CITY & GUILDS 3666-02 Unit 2

Certificate in Communications Cabling Level 2

# Fibre Optic Cabling in an Internal Environment

Local Area Networks, CCTV,  
Alarms and Security Systems

*This unit is concerned with the installation, splicing, connectorisation, termination and testing of fibre optic cable in a typical datacomms environment, characterised by low fibre count cables (typically less than 24 fibres) terminated in patch panels/equipment racks. This would usually take place in an indoor environment involving multimode and singlemode end-to-end cabling.*



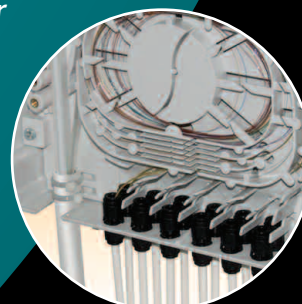
Optical Distribution  
Frames



Fusion Splicing  
Techniques



Customer Premises  
Equipment



Air Blown Fibre Systems

## Outcome 1

*Work safely with optical fibres in an internal environment*

### Practical activities

**You will:**

- Conduct a risk assessment prior to installation of optical fibres in an internal environment
- Work safely when installing, splicing, terminating and testing optical fibre in an internal environment

### Underpinning knowledge

**You will be able to:**

- State the rules for safe working when undertaking the installation of fibre cables
- State the rules for safe working with fibre cables when carrying out preparation
- State the rules for safe working and any special precautions when splicing
- State the rules for safe working and any special precautions to be observed when terminating fibres onto connectors
- State the rules for safe working and any special precautions to be observed when testing

## Outcome 2

*Follow recommended installation procedures*

### Practical activities

**You will:**

- Check cable and components before installation
- Ensure that specified cable laying procedures are followed
- Test laid cable before jointing/termination

### Underpinning knowledge

**You will be able to:**

- State the use of fibre optics in LANs
- Identify multimode optical fibres as graded index (GI) and singlemode G652 as step index
- Distinguish types of optical fibre
- State fibre specifications and parameters
- State the recommended fibre and cable inspection test methods and documentation
- Identify the component parts of an optical fibre used in communication systems
- State the use of the components
- Explain the use of installation equipment
- State the requirements for checking cable and components in accordance with relevant European Standards
- State the methods and means to follow work plans and instructions
- State the rules for undertaking cable installation and fibre management
- State the methods of testing laid cable before jointing/termination

## Outcome 3

*Prepare fibre optic cable for fibre connectorisation and splicing*

### Practical activities

**You will:**

- Prepare cable for connectorisation and splicing
- Prepare coated fibre for connectorisation and splicing

### Underpinning knowledge

**You will be able to:**

- State the characteristics of cables as indoor/outdoor/universal
- State the basic constructional features of fibre optic cable and coatings
- Select and use cable cutting and stripping tools
- State the purpose and use of fibre cleaning materials and the techniques involved
- State the rules and any special precautions to be observed when carrying out preparation

## Outcome 4

*Splice together optical fibres*

### Practical activities

**You will:**

- Prepare bare fibre for splicing
- Splice fibres using fusion splicing techniques
- Splice fibres using mechanical splice techniques

### Underpinning knowledge

**You will be able to:**

- Explain the benefits and criteria for using the main splice methods
- State the working principles of splicing
- Explain how to use fibre cleaving tools and the fibre preparation techniques
- State the possible causes of faults in cleaving
- Identify splice equipment according to range and application
- Identify mechanical splices, accessories and splice protection housings
- Identify splice protection systems for working within patch panels
- Identify splice management, protection systems and procedures for working with low fibre count cables within a patch panel
- Identify potential problems when undertaking splicing and describe possible causes
- State the performance requirements of splices according to European Standards
- State the rules and any special precautions for splicing

## Outcome 5

*Terminate fibre optic cables by fitting connectors*

### Practical activities

**You will:**

- Fit a variety of fibre optic connector styles, including straight tip (ST), subscriber connector (SC) and small form factor (SFF) to fibre optic cables, using at least four different termination technologies from epoxy and polish, anaerobic adhesive, pre-glued, pre-polished and crimped

### Underpinning knowledge

**You will be able to:**

- State the types and uses of common connectors for appropriate termination methods
- Identify termination tools and materials
- State the fitting procedures for connectors
- State the possible causes of common faults in termination
- State the performance tests for termination

## Outcome 6

*Test fibre optic links*

### Practical activities

**You will:**

- Test fibre continuity using a visible light source
- Measure the insertion loss using an infrared light and power meter
- Test link performance using Optical Time Domain Reflectometer (OTDR) techniques

### Underpinning knowledge

**You will be able to:**

- Explain how to perform loss calculations
- State the range of test methods and the purpose of testing to measure cable performance
- State the use and principle of operation of test equipment
- Explain how to use insertion loss testing equipment and procedures to measure connector insertion loss and cabling system losses
- Explain how to apply and operate an OTDR
- State the procedures for testing in accordance with relevant standards and test conditions
- Explain how to apply and operate test equipment to prevent source of error
- Explain the results and recognise acceptable link and component performance with reference to relevant specification and record the results on appropriate documentation

### CTTS Ltd

The National Training Centre,  
Jubilee Place, Lindum Business Park,  
Station Road, North Hykeham,  
Lincolnshire LN6 3QX UK  
T: +44 (0)1522 880900  
F: +44 (0)1522 880901  
E: [info@cable-training.co.uk](mailto:info@cable-training.co.uk)  
[www.cable-training.co.uk](http://www.cable-training.co.uk)