

Fibre Optic Cabling in an External Environment

This unit is concerned with the installation, splicing, termination and testing of fibre optic cables, typically a multi-element, singlemode fibre cable of at least 24 fibres, used in an external environment with applications in Long Haul Telecommunications, Wide and Metropolitan Area Networks, Railway Signalling, Motorway Signage, City CCTV Networks and Traffic Control Systems.



Fibre Connectivity



FTTH Entry Kits



Optical Loss Budgets



Fibre Optic Closures

Outcome 1

Work safely with optical fibres in an external environment

Practical activities

You will:

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

Underpinning knowledge

You will be able to:

- State the rules for safe working when undertaking the installation
- 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 testing

Outcome 2

Follow recommended installation procedures

Practical activities

You will:

- Check cable and components before installation
- Check that correct 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 the communications network
- State the singlemode optical fibre types
- State fibre specifications and parameters
- State the fibre and cable inspection test methods and documentation
- 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 splicing

Practical activities

You will:

- Prepare cable for splicing
- Prepare coated fibre for splicing

Underpinning knowledge

You will be able to:

- Identify the characteristics of cables as indoor/outdoor/universal

- State the basic constructional features of singlemode fibre 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

Joint fibre optic cables by splicing

Practical activities

You will:

- Set up working environment for outdoor cable jointing
- Prepare bare fibre for splicing
- Splice fibres using fusion splicing techniques
- Splice fibres using mechanical splice techniques
- Organise cables, tubes and fibres into joint housing
- Seal joint enclosure using a shrink down

Underpinning knowledge

You will be able to:

- State the requirements for a cable joining environment
- 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 potential problems when undertaking splicing and describe possible causes
- Describe the use of splice management and protection systems and procedures for working with multi element cables containing at least 24 fibres within a joint housing
- State the sealing and cable retention methods for joint closure systems
- State the rules and special precautions for splicing

Outcome 5

Terminate fibre optic cable by splicing on pre-terminated pigtailed

Practical activities

You will:

- Set up work environment for cable termination
- Organise cables, tubes and fibres into Optical Distribution Frame (ODF)
- Prepare bare fibre for splicing
- Prepare secondary coated fibre for splicing
- Splice fibres using fusion splice techniques

Underpinning knowledge

You will be able to:

- State a range of connectors suitable for a telecomms environment

- State the requirements for efficient and effective cable termination
- State the working principles of splicing
- Explain how to use fibre cleaving tools and the correct fibre preparation techniques
- State the possible causes of faults in cleaving
- Identify splice equipment according to range and application
- State the use of a variety of mechanical splices, accessories and splice protection housings
- State the use of splice management and protection systems and procedures for working with multi element cables containing at least 24 fibres within an ODF

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:

- State the range of test methods and the purpose of testing to measure cable performance
- State the use and principles of operation of test equipment
- State the use of testing equipment and procedures
- State the application and operation of an OTDR
- State the procedures for testing in accordance with relevant European Standards and test conditions
- Explain how to apply and operate test equipment to prevent sources of error
- Explain the results and recognise acceptable link and component performance with reference to relevant specification and record the results on appropriate documentation.

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