

PEARSON TECHNOLOGIES
I N C O R P O R A T E D

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14-Aug-15

**Crossword Puzzles
For
Fiber Optic Terminology
And Basic Facts**

This document is an aid for training fiber optic installers. In addition, it prepares installers for taking the Fiber Optic Association {FOA} Certified Fiber Optic Technician [CFOT] certification examination.

It is based on Professional Fiber Optic Installation, v.9 [© 2014, available from Amazon.com] and on the latest CFOT certification examination.

This crossword includes the basics of the language of fiber optics and many of the subtleties that one learns from extensive field work.

To receive a .pdf with the answers, send an email to the address above. Put "Crossword 2015 Answers" in the subject.

Have fun.

Best Regards,

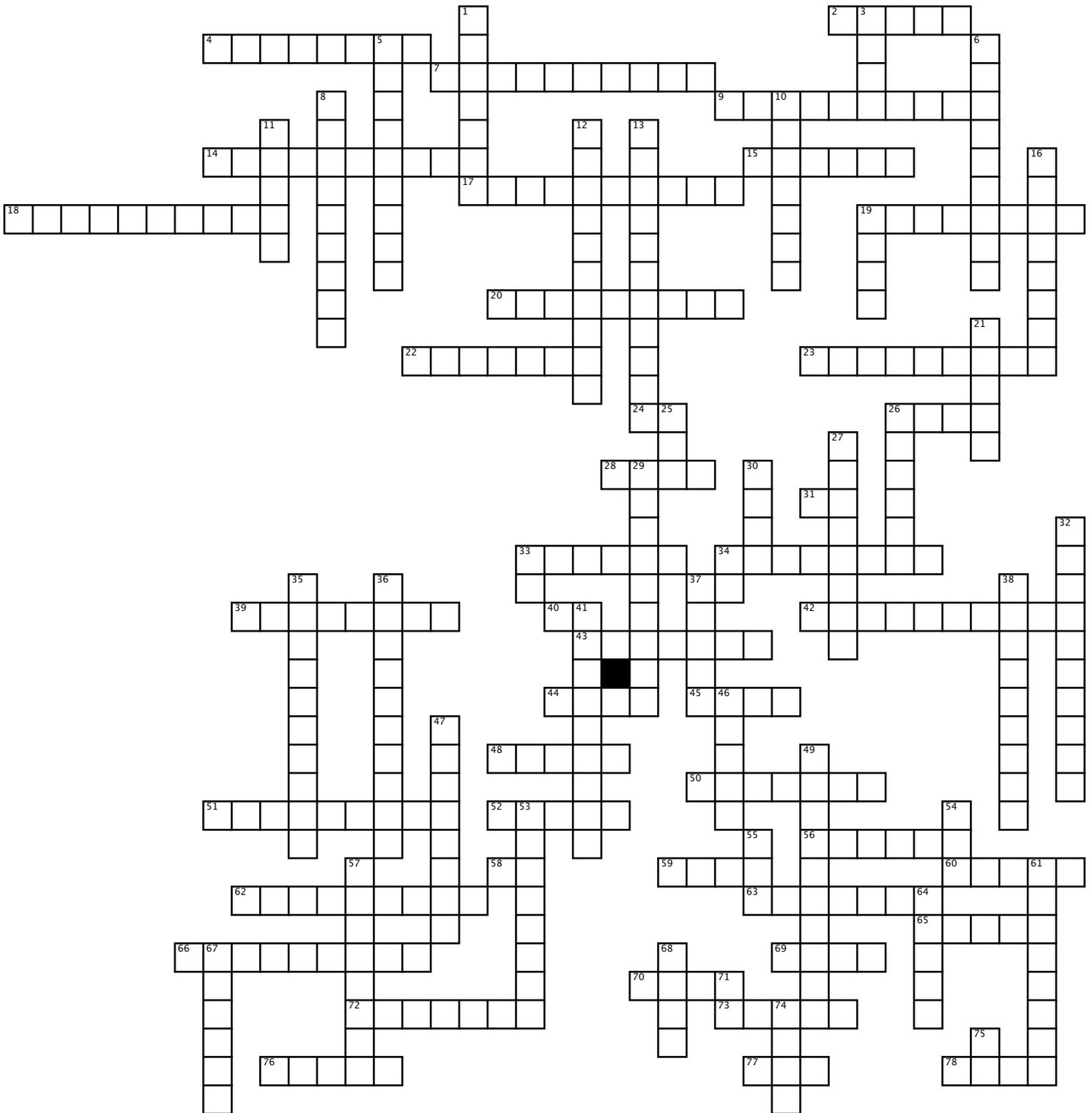


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Light And Fiber

PROFESSIONAL FIBER OPTIC INSTALLATION, V.9

Chapters 1-3, 15



Across

2. minimizing _____ is the most important concern of installer (first word)
4. in (14 Across) fibers, some of the optical power travels in the _____
7. 1310 is a _____
9. the technical name for the mechanism describing change in width of optical pulse as pulse travels through fiber
14. telephone systems use _____ fibers
15. unit of fiber (27 Down)
17. one of two mechanisms that reduces (9 Across) in (8 Down) fiber
18. 1550 is a wavelength used on _____ fibers
19. region of fiber that confines light to center of fiber
20. as (7 Across) increases, (13 Down) _____
22. material of first optical fiber developed
23. Fiber type in which light can take many paths
24. abbreviation for units of measure for (7 Across)
26. 50 is a _____ diameter
28. acronym for term that indicates capacity of (8 Down) fibers developed
31. During testing, the installer must match the _____ of the fiber under test to that in the test leads
33. first word of old term for the layer that protects fiber
34. in (8 Down) fibers, optical power _____ at (26 Across)- (4 Across) boundary
37. acronym for the second type of (8 Down) fiber developed
39. 125 μ is a _____ (first word)
40. acronym for type of fiber optimized for use with VCSELs
42. first word of term that is a measure of the speed of light in fiber
43. first word in layer that protects fiber
44. the number of causes of (9 Across)
45. First word for first type of fiber with a single composition in core
48. what the installer does to the outer layer of the fiber
50. One of two types of reflections
51. 850 nm is a wavelength used on _____ fibers
52. the type of light source used on (8 Down) fiber for transmission at and above 1 Gbps
56. first word for second type of fiber with multiple compositions in center
58. acronym for the technical term that is created by difference in composition in (68 Down) and (4 Across) of fiber
59. first word for the acronym for the wavelength of maximum capacity
60. largest type of (9 Across)

Down

1. A (14 Across) core is _____ than a (8 Down) core
3. acronym for test equipment that enables viewing the loss of power along a fiber
5. unit in measure for wavelength
6. first word of acronym for term that indicates capacity of (8 Down) fibers developed
8. many data systems use _____ fibers.
10. the second type of (14 Across) fiber developed was dispersion _____
11. second word of term indicating speed of light in fiber
12. excessive (9 Across) results in signal _____
13. term that describes the loss of power in fiber
16. Not (14 Across), but another name for fiber in which light travels in a single path
19. acronym indicating 3-16 wavelengths traveling in fiber
21. The capacity of (8 Down) fibers is _____ than that of (14 Across) fibers.
25. acronym for region of fiber with small core in which most of optical power travels
26. (33 Down) fibers _____ be used as test leads
27. 125 μ is a _____ (second word)
29. technical name for optical fiber
30. (46 Down) reflection occurs at _____ boundary (first word)
32. third word for the acronym for the wavelength of maximum capacity
33. acronym for fiber with reduced sensitivity to power loss when bent
34. abbreviation for term that indicates speed of light in fiber
35. determines both (9 Across) and (13 Down)
36. second word for the acronym for the wavelength of maximum capacity
37. material of most fibers
38. fibers are designated by at least two _____
41. second word indicating type of fiber optimized for use with VCSEL
46. Second type of reflection
47. type of (9 Across) that results from non crystalline or amorphous structure of fiber material
49. fiber type in which light takes a single path
53. (46 Down) reflection occurs at _____ boundary (second word)
54. acronym indicating two wavelengths traveling in fiber
55. acronym for first fiber developed
57. first word of the characteristic of fiber that is created by the difference in composition in (4 Across) and (68 Down) of fiber

Across

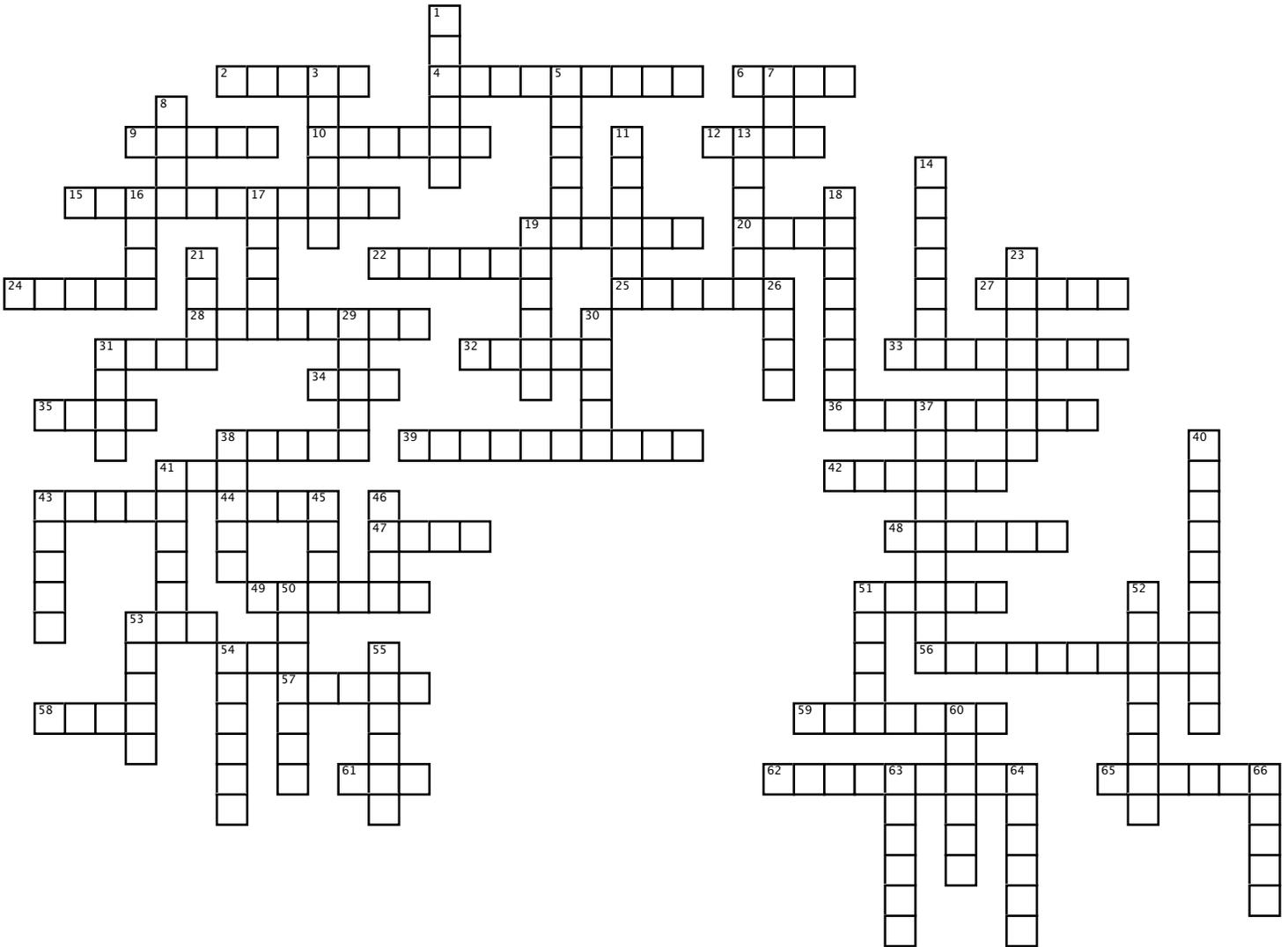
62. first word for technical term that is created by the difference between the compositions of (4 Across) and (68 Down) of fiber
63. Technical name for (50 Across) reflection
65. second word of fiber term that is created by difference in composition in the (4 Across) and (68 Down) of fiber
66. second largest type of (9 Across) that results from a characteristic of the transmitter
69. region of fiber in which most of light energy travels
70. minimizing _____ is most important concern of installer (second word)
72. second word in layer that protects fiber
73. second word for first type of fiber with single composition in core
76. second word of the region of fiber with small core in which most of the optical power travels
77. acronym for the wavelength of maximum capacity
78. first word of acronym for region of fiber with small core in which most of the optical power travels

Down

61. second word for technical term that is created by difference in composition in center and second layer of fiber
64. first word indicating type of fiber optimized for use with VCSEL
67. OM3 and OM4 have _____ bandwidth or capacity than OM1 and OM2
68. During testing, the installer must match the _____ of the fiber under test to that in the test leads
71. acronym for first type of fiber developed
74. acronym indicating up to 200 wavelengths traveling in fiber
75. OM3 and OM4 are _____ fibers.

Cables

PROFESSIONAL FIBER OPTIC INSTALLATION, V.9
Chapters 4, 10, 11



Across

2. a _____ tube contains only one fiber
4. a type of cable containing both conductors and fibers
6. To avoid fiber breakage, the installer must limit the _____ applied to the cable
9. fifth color in the color code sequence
10. The first word of the first layer placed on the fiber by the cable manufacturer
12. an (acronym) cable is (40 Down) and can be installed anywhere inside a building and be in compliance with the electrical code
15. Subjecting a cable to an excessively high or low temperature results in increased _____
19. ninth color in the color code sequence
20. an (acronym) cable is (40 Down) and can be installed in a single floor or between floors inside a building and be in compliance with the electrical code

Down

1. the outermost layer of a cable
3. a cable with both multimode and singlemode fibers
5. second color in the color code sequence
7. an (acronym) cable is (40 Down) and can be installed in a single floor inside a building and be in compliance with the electrical code
8. first color in the color code sequence
11. tenth color in the color code sequence
13. When being terminated, a multiple fiber per tube cable requires a _____ kit on the fibers
14. The third word of (54 Across) is _____
16. The second word of the first layer placed on the fiber by the cable manufacturer
17. The structural element that provides crush and rodent resistance
18. Exceeding the installation load can result in fiber _____
19. _____ color of jacket on indoor singlemode cables

Across

22. First word of a method to reduce load when pulling cable into a conduit
24. a _____ tube can contain more than one fiber
25. During installation, the minimum bend radius of a cable is _____ times the cable diameter
27. Second word of a method to reduce load when pulling cable into a conduit
28. the first word of the structural element that prevents excessive stretching of the fibers
31. The one hundred and thirty first fiber in loose tube cable has a _____ color
32. The _____ term bend radius is larger than the (43 Down) term bend radius.
33. The name of the most commonly used indoor cable type
34. seventh color in the color code sequence
35. The time to prepare a cable with (54 Across) is _____ than that with (41 Across) and (41 Down)
36. The cable (28 Across) (42 Across) is attached to the _____ at the cable ends
38. fourth color in the color code sequence
39. A common (28 Across) (42 Across) is often white and is _____
41. old outdoor cables achieved moisture resistance with _____ inside buffer tubes
42. the second word of the structural element that prevents excessive stretching of the fibers
43. The first word of (54 Across) is _____
44. twelfth color in the color code sequence
47. The designation of an indoor cable that has conductive elements and can be placed anywhere
48. Cable structural material used as a manufacturing aid or to keep cable round
49. color of jacket on indoor multimode cables
51. The most common color of an outdoor cable
53. After installation, the minimum bend radius of a cable is _____ times the cable diameter
54. current generation cables achieve moisture resistance with this (acronym)
56. maximum number of fibers in a (63 Down) is _____
57. fibers in a loose tube are identified by their _____
58. A common jacket material in outdoor cables
59. A cable with all fibers in a single (24 Across) (16 Down) is a _____ loose tube cable
61. acronym for the National Electric Code
62. The second word of (54 Across) is _____
65. Indoor singlemode cables have the color _____

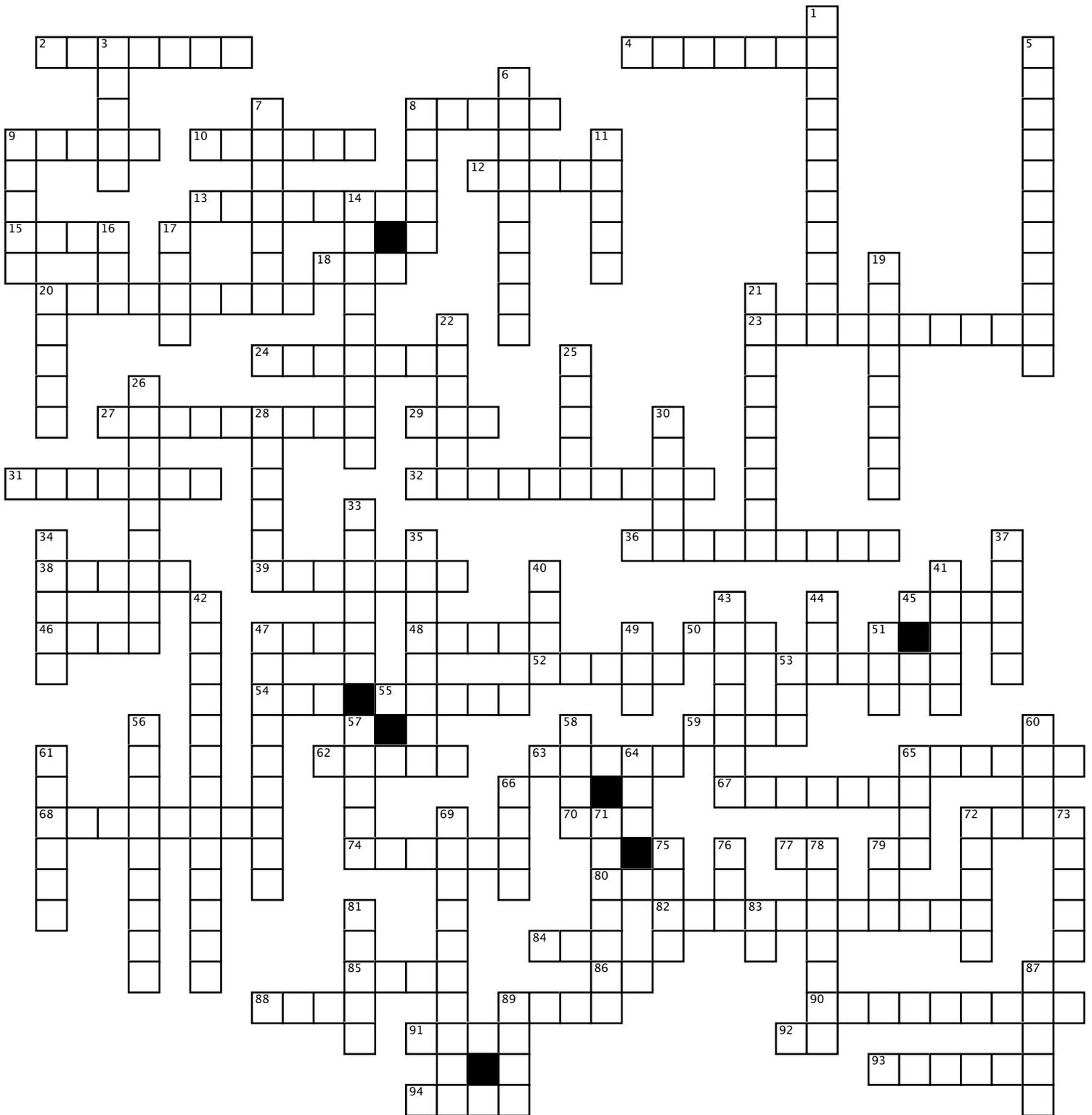
Down

21. eleventh color in the color code sequence
23. The cable bend radius is a _____ value
26. In a (59 Across) (24 Across) (16 Down) cable, the fiber bundles are held together by a color coded _____
29. third color in the color code sequence
30. A conductive (28 Across) (42 Across) is _____
31. The one hundred and thirty first fiber in loose tube cable has a buffer tube with a _____ color
37. A material used to reduce load when pulling cable into a conduit
38. eighth color in the color code sequence
40. A cable which has no conductive materials is _____
41. old outdoor cables achieved moisture resistance with _____ outside buffer tubes
43. During installation, the (54 Down) between the pull rope and the cable has a _____ pin to avoid fiber breakage.
45. color of jacket on indoor LO cables
46. When stored, a cable cannot be bent smaller than its _____ term radius.
50. structural element that eases removal of jacket
51. A group of fibers that is installed into a preinstalled tube with air pressure is known as _____ fiber
52. When entering a building, cable with (17 Down) must be _____
53. The number of colors used to indicate fiber type of indoor cables
54. During installation, the installer places a _____ between the pull rope and the cable to avoid twisting.
55. When being spliced mid-span, cable with (17 Down) must be _____
60. A common (28 Across) (42 Across) is _____ yarn
63. Twelve fibers aligned on a tape form a _____
64. The number of fibers commonly found in a (24 Across) buffer tube
66. sixth color in the color code sequence

Connectors & Splices

PROFESSIONAL FIBER OPTIC INSTALLATION, V.9

Chapters 5, 6, 12, 13, 20-25



Across

2. Another term for (65 Across) splicing is glass _____

Down

1. The (74 Across) on a ferrule tip has two benefits. One is reduced _____
3. (51 Across) stands for (first word)

Across

4. The second type of (65 Across) splicing is _____ alignment
8. If the (45 Across) of a properly installed connector is not (48 Across), part of the (45 Across) is _____ the surface of the ferrule
9. The ferrule surface of a properly installed connector is _____
10. A name of a popular connector that requires no polishing is _____
12. A connector that requires no (6 Down) has a pre-installed _____
13. All (32 Across) splices contain an _____ (second word)
15. LO connectors have the color _____
18. A heat shrink (87 Down) has a _____ (second word)
20. When installing connectors on a patch cord, the strength members are attached to the _____ of the connector
23. The (44 Down) is created by two _____
24. Creating a (9 Down) fiber requires _____ (second word)
27. Connectors are used for _____ connections
29. connectors have consistent power loss from insertion to insertion because of the _____
31. When properly installed, connectors do not exceed their _____ loss
32. The second type of splicing is _____
36. One type of (65 Across) splicing is _____ (second word)
38. All (32 Across) splices contain an _____ (first word)
39. Most fiber optic connectors have one fiber and are called _____
45. One type of (65 Across) splicing is _____ alignment
46. One connector installation method uses a _____ adhesive (second word)
47. In both connector installation and splicing, the fiber must be _____ and _____ (first word)
48. a properly installed connector (45 Across) is _____
50. One connector installation method uses a _____ adhesive (first word)
52. A heat shrink (87 Down) has a _____ (first word)
53. One type of (65 Across) splicing is _____ alignment
54. When not in use, a connector should have its _____ installed
55. A properly installed connector has a _____ (72 Across)
59. Connectors exhibit loss when in a _____
62. A properly installed connector core is _____ with the ferrule

Down

5. Another of the characteristics of a properly installed connector (72 Across) is _____
6. The (94 Across) supports the (81 Down) during _____
7. A short length of buffer tube with a connector on one end is a _____
8. If not the colors (15 Across) or (20 Down), the multimode connector color is _____
9. The cladding of a properly installed connector is _____
11. When installing connectors on a patch cord, the strength members are attached to the (20 Across) of the connector by a _____ (first word)
14. Creating a (9 Down) fiber requires _____ (first word)
16. The acronym for a (25 Down) connector is _____
17. The (54 Across) keeps _____ off the tip.
19. Most (65 Across) splicers display an _____ of the splice loss
20. If not LO, connectors for this same core diameter have the color _____
21. (51 Down) stands for (third word)
22. When installing connectors on a patch cord, the strength members are attached to the (20 Across) of the connector by a _____ (second word)
25. the connector color that has no reflectance is _____
26. Splices are used for _____ connections
28. The (89 Across) controls the fiber _____ (second word)
30. the first word of (76 Down) is _____
33. connectors with two fibers are _____
34. (6 Down) is done with multiple _____
35. The _____ of the connectors aligns the fibers
37. In both connector installation and splicing, the fiber must be _____ and _____ (second word)
40. most (6 Down) is done on _____
41. (93 Across) splicing aligns singlemode fiber _____
42. Loss loss splices require fiber ends that are _____ and _____ (second word)
43. Current connectors make _____
44. (65 Across) splicing is performed by an electrical _____
47. The first of the (64 Down) ways to inspect a connector is with _____
49. All (32 Across) splices contain an _____ (third word)
51. The second type of (65 Across) splicing is _____ (acronym)
53. If (40 Down) are not used in (6 Down) the step is called _____ (6 Down)
56. (32 Across) splicing aligns singlemode fiber _____

Across

63. Early connector (6 Down) was performed on a flat _____
65. The first type of splicing is _____
67. When properly installed, connectors exhibit _____ loss
68. (32 Across) splicing aligns the fiber _____
70. There are ____ types of (65 Across) splicing
72. The loss of a connector is determined mostly by the condition of the _____
74. Today's connectors have a _____ on the tip of the ferrule
77. The unit of measure of splice (66 Down) is _____
79. a common connector type
80. Whenever possible, the installer should inspect connectors with a microscope in ____ ways
82. Connectors with a (65 Down) ferrule tip have high _____
84. There are _____ types of splicing.
85. If not (25 Down), (69 Down) connectors have the color _____
86. The splice is placed in a splice holder with the (18 Across) _____
88. According to the standards, there are _____ connector colors
89. The installer installs a _____ on the (20 Across) of all connectors
90. (51 Down) stands for (second word)
91. Active splicing aligns the (45 Across) fiber _____
92. a common, push on, pull off, connector type
93. One type of (65 Across) splicing is _____
94. (73 Down) and (50 Across) (46 Across) installation methods leave a _____ on the ferrule tip

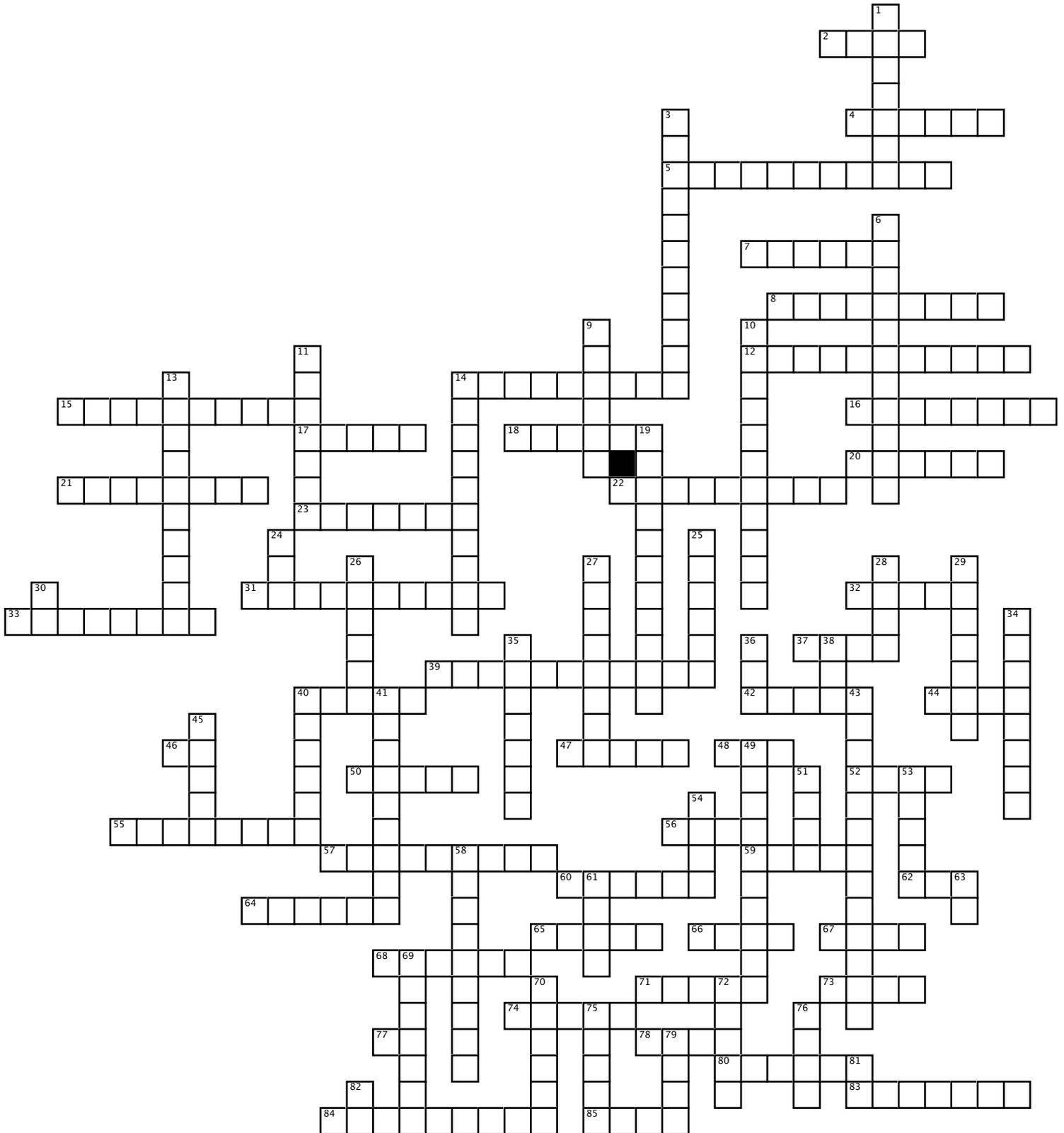
Down

57. Another of the characteristics of properly installed core is _____
58. Low loss splices require fiber ends that are _____ and _____ (first word)
60. The (45 Across) of a properly installed connector has ____ characteristics
61. the third word of (76 Down) is _____
64. There are _____ types of (65 Across) splicing.
65. The first connectors had a _____ ferrule tip
66. The (28 Down) on a ferrule tip has two benefits. The second is reduced _____
69. (16 Down) connectors are for ____ fibers
71. The second of the (70 Across) ways to inspect a connector is _____ (47 Down)
72. connectors serve to align the _____ of the fibers
73. The earliest connectors used _____ to retain the fiber
75. the second word of (76 Down) is _____
76. current small connector types are (acronym)
78. an early fiber optic telephone connector type
79. an early type of fiber optic data connector
81. The (94 Across) supports the _____
83. a popular (76 Down) connector type
87. Fusion splices are protected in a _____
89. The (89 Across) controls the fiber _____ (first word)

Optoelectronics And Testing

PROFESSIONAL FIBER OPTIC INSTALLATION, V.9

Chapters 8, 14, 15



Across

2. EF stands for (second word)
4. The cable between an OTDR and the cable under test is known as a _____ cable
5. The _____ calibrates the OTDR to create accurate attenuation rate measurements (second word)
7. Without a second launch cable, the OTDR _____ cannot measure the loss of the far end connector from the near end
8. Usually, insertion loss measurements in opposite directions are _____
12. On an OTDR trace, fiber _____ creates (3 Down)
14. During insertion loss testing, the installer matches three characteristics of the test leads to those of the cable under test. One of these characteristics is _____
15. The OTDR trace shows three types of features. A second is _____
16. A properly installed cable segment has a _____ line
17. Properly made fusion splices and bend radius violations can create _____
18. If the opposite of (32 Across) insertion loss value is observed, the installer should expect _____ on the cable
20. To measure the loss of the near end connector with an OTDR, the launch cable needs to be _____ than the (44 Across) zone
21. The (4 Across) cable _____ the OTDR port
22. As the wavelength increases, the fiber (19 Down) to (18 Across) _____ (second word)
23. (36 Down) stands for (third word)
31. A test source is _____
32. Insertion loss values at a long wavelength are _____ than those at a short wavelength
33. (40 Across) stands for (fourth word)
37. During insertion loss testing, the installer matches three characteristics of the test leads to those of the cable under test. One of these characteristics is _____
39. In the insertion loss test, the source simulates the _____
40. EF launch conditions come close to simulating the launch conditions of a _____ transmitter
42. Singlemode transmitters have _____ _____ (first word)

Down

1. (40 Across) stands for (third word)
3. The _____ calibrates the OTDR to create accurate attenuation rate measurements (first word)
6. On an OTDR trace, the slope of the (3 Down) line is the _____ (first word)
9. The mandrel used to establish HOML conditions is sized to the diameters of the _____ and _____ (second word)
10. The OTDR trace shows three types of features. One is _____
11. A HOML launch conditions may, or may not, require a _____
13. A fiber end can create _____
14. During insertion loss testing, a _____ power meter is used
19. As the wavelength increases, the fiber _____ to (18 Across) (22 Across)
24. If the maximum distance setting on the OTDR is less than the length of the cable under test, the installer will _____ see the far end of the cable
25. A splice with a positive loss on an OTDR is known as a _____
26. Singlemode transmitters have _____ _____ (second word)
27. In the insertion loss test, the meter simulates the _____
28. The mandrel used to establish HOML conditions is sized to the diameters of the _____ and _____ (first word)
29. The technical name for a (73 Across) is a _____ (13 Down)
30. Wavelength is measured in units of _____
34. The loop on a singlemode test lead removes _____ in the _____ (second word)
35. A (16 Across) (10 Down) indicates _____ loss
36. An installer uses a _____ (acronym) to find locations of excessive power loss in a splice case or near the end of a cable
38. During an insertion loss test, the input power level is measured with _____ lead(s)
40. (36 Down) stands for (first word)
41. EF stands for (first word)
43. OTDR stands for (fourth word)
45. (36 Down) stands for (second word)
49. The _____ of the test source matches the same characteristic of the transmitter.

Across

44. A (13 Down) and (17 Across) create ____ zones
46. During insertion loss testing, the installer matches three characteristics of the test leads to those of the cable under test. One of these characteristics is _____
47. The OTDR trace shows three types of features. A third is _____
48. During an insertion loss test, the output power level is measured with _____ lead(s)
50. EF launch conditions are used to test fiber with a _____ micron core diameter at 850 nm
52. when performing a singlemode insertion loss test, the installer puts a _____ in the test lead connected to the source.
55. (40 Across) stands for (first word)
56. HOML stands for (third word)
57. HOML testing is performed on _____ fiber
59. The (52 Across) in the singlemode test lead removes _____ in the _____ (first word)
60. A properly installed connector pair with radius tips _____ creates a (15 Across)
62. The color of the light in (36 Down) is _____
64. The multimode test method indicated by input power measurement with one lead and output power measurement with two leads is known as _____ B.
65. (40 Across) stands for (fifth word)
66. HOML stands for (first word)
67. Early multimode transmitters created light with _____
68. (40 Across) stands for (second word)
71. In the insertion loss test, the test leads simulate the _____ _____ on the end of a backbone cable (first word)
73. A (13 Down) is also known as a _____
74. A (44 Across) zone is also known as a _____ zone
77. The _____ calibrates the OTDR to create accurate length measurements
78. The _____ enables identification of multiple loss locations in a single test
80. OTDR stands for (third word)
83. OTDR stands for (first word)
84. On an OTDR trace, a singlemode mechanical splice _____ creates a (13 Down)
85. The slope of the (10 Down) is the _____ _____ (second word)

Down

51. If the maximum distance setting on the OTDR is much longer than the length of the cable under test, the installer will experience _____ test time
53. HOML stands for (second word)
54. HOML stands for (fourth word)
58. A (40 Across) is used on _____ fibers
61. When measured in the opposite direction, (16 Across) always shows a _____
63. On an OTDR, power loss is in units of _____
69. The true loss of a splice is the _____ of the losses measured in both directions with an OTDR
70. A multimode mechanical splice _____ creates a (13 Down)
72. In the insertion loss test, the test leads simulate the _____ _____ on the end of a backbone cable (second word)
75. A properly made fusion splice _____ creates a (13 Down)
76. The (4 Across) cable enables testing of the _____ end connector
79. OTDR stands for (second word)
81. On an OTDR trace, a connector with an 8° angle on the end face on the far end of the cable will have _____ (13 Down)
82. On an OTDR trace, a connector pair with 8° end faces will have _____ (13 Down)