

OUR COMPANY

KITCO™ Fiber Optics is a leading provider of fiber optic termination products and consulting services to the military and commercial communications industry. We specialize in the design and fabrication of fiber optic tools, tool kits and custom cable assemblies. We also produce private label kits for a number of major connector manufacturers and sell our own broad line of products. Our field services division performs on-site termination, splicing, troubleshooting and testing support, and our training division provides hands-on training and certification programs.

We are recognized within the defense industry as fiber optic connectivity experts and, for over 20 years, have customized our products and services to meet strict military standards. We work with and support major defense contractors and government agencies such as AMSEC, Boeing, General Dynamics, L3 Communications, Lockheed Martin, NASA, Northrop Grumman, SERCO and the U.S. Armed Forces.

OUR MISSION

Our mission is to be the leading provider of fiber optic connectorization products, training and services to the military and commercial communications industry. We will do this by exceeding our customers' expectations for service, quality and responsiveness in a way that also benefits our employees, our suppliers and our community.



OUR TRAINERS



KEVIN BARKS
Training Manager

EAST COAST



**FELIPE
GUADALUPE**
Trainer



SCOTT DADAIAN
Trainer



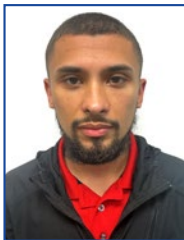
BILL RALSTON
Trainer



DAVID STARNES
Trainer



BRICE WILSON
Trainer



RYAN KNIGHT
Trainer

WEST COAST



**GEORGE "FRANKIE"
FRANCESCHI**
Trainer



MARK MYLAND
Trainer

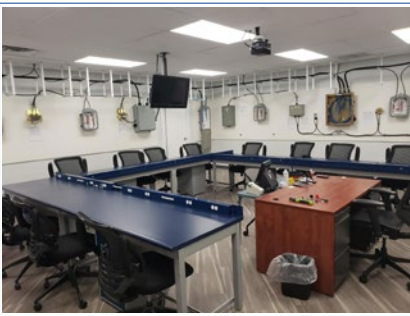


**JOSEPH
RIVADENEIRA**
Trainer

TRAINING OVERVIEW

KITCO's superior hands-on training is designed and delivered by the fiber optic experts and can affordably have you up to speed and certified in a week or less! Our trainers have exceptional credentials including advanced industry certifications, substantial field experience and over 140 years of combined direct classroom experience. We have trained thousands of students worldwide on terminating, splicing and testing fiber systems. KITCO's state-of-the-art training facilities are located in our headquarters in **Norfolk, Virginia** and in **National City, California** serving the San Diego and surrounding areas. Our classrooms feature state-of-the-art equipment and toolings with realistic mock-ups of shipboard applications that meet the latest industry requirements. Our established mobile training services provide the ability to train globally at your desired location—anywhere in the world—customizing and tailoring our courses to meet your training requirements.

“We’re ready to roll at a moment’s notice.”



MILITARY TRAINING

KITCO develops curriculum and training courses for the U.S. Armed Forces. KITCO was the sole source provider and maintainer of fiber optic training to Navy sailors for over 17 years. Over the last three decades, KITCO has worked closely with the Navy, shipyards and vendors who build our fleet. Training them how install, terminate and test the fiber optic cable plants that are the backbone of our ships and submarines. In addition, our instructors collaborated on the design of termination and testing equipment currently specified in MIL-STD 2042C located in Parts 5 and 6. (The standard governing the installation of fiber optic networks on U.S. Navy ships and submarines) KITCO also works closely with the ARMY developing the next generation of fiber optic test equipment as part of the Army's TEMOD program.



NAVSEA TRAINING

This is mandatory training for any person that currently is or has the potential to perform Navy Shipboard fiber optic installations. These personnel include (but are not limited to) supervisors, fiber optic QA inspectors, installers/technicians employed by: ship builders, SUPSHIP, and Government/Contracted Installation/Repair Teams, AIT's, Ship/Planning Yards, OSR's, RMC's, FMA's, ISEA'S, and Industrial Activities. All personnel that currently are or have the potential of performing Navy shipboard fiber optic installations in any form (e.g., pulling fiber, installing connectors, installing fiber optic interconnection boxes, testing fiber optic links, etc.) shall obtain Navy shipboard fiber optic training from a training organization included on the Certified Fiber Optics Trainers List (CFOTL).

These modules are created and provided by the Certified Organization and are in accordance with the training curriculum requirements, as specified in Section 5 of NAVSEA Drawing 8477552.

Any organization responsible for performing fiber optic installations on new construction, alterations, or repairs of ships, whether public or private are required to attend certified training from a Certified Fiber Optic Trainer company maintained by the NSWCDD Fiber Optics Section. KITCO™ Fiber Optics is pleased to announce we are the first approved Certified Fiber Optic Training Company to offer this training.

In order to more effectively offer this training, KITCO™ has bundled certain complimentary modules such that multiple modules are presented in a course format.

COMMERCIAL TRAINING

We are proud to be one of the nation's premier providers of certified commercial fiber optic training. Our courses are industry recognized and approved for certifications by Corning and KITCO™. Industry standards including those of the Telecommunications Industry Association (TIA) and the National Electrical Code (NEC) are incorporated into KITCO's courses. Students are offered the option of taking the Electronics Technicians Association (ETA) Certified Fiber Optic Installer (CFOI) and the Certified Fiber Optics Technician (CFOT) exams.

NAVY APPROVED!

Optical Loss Test Set (OLTS) and Optical Return Loss Meter (ORLM)

Smarter
network
in sight.

EXFO



The MAX-945-NAV-M2042-KIT*

Improve test cycle time and reduce equipment logistics with leading test and measurement gear, approved by the US Navy [GPETE SCAT 4960, NSN: TBD].

No need for separate units, all-in-one design replaces both SCAT 4952 and SCAT 4954 and covers:

- OLTS testing - singlemode and multimode
- Singlemode ORL
- Light source and power meter

*MAX-945-NAV-M2042-KIT-NP does not include the probe



Supports US Navy
fiber-optic test
methods.

Configured to support Navy test methodology in MIL-STD-2042. Built-in software to record results.



Includes Navy-
required launch
cables

Kit includes six certified simplex MQJs.



Offers further options
for accessories

Improve kit functionality with additional accessories, such as fiber endface inspection probe.

KITCO is a Navy-certified trainer for installing, maintaining, and troubleshooting shipboard fiber optics. KITCO is a certified supplier of EXFO test solutions.

KITCO
fiber optics

Contact us today to get your kit.

KITCO Fiber Optics
1151 Azalea Garden Road
Norfolk, VA 23502

kitcofiberoptics.com
sales@kitcofo.com
Phone: 757 518-8100

The MAX-945-NAV-M2042-KIT

EXFO



Navy
approved!



Approved on recommended test equipment
list for Navy shipboard fiber optics.
TS-0004, TS-0005, TS-0006

The MAX-945-NAV-M2042-KIT

The only single unit Navy optical test kit approved for MM, SM and SM ORL optical fiber testing.

MIL-STD-2042C compliance.

Multimode and singlemode insertion loss (IL).

Singlemode Optical Return Loss (ORL) testing.

MIL-STD-2042-6C test methods compliance.

- 6C1 cable assembly link loss test.
- 6E1 cable topology end-to-end attenuation test.
- 6K1 cable assembly return loss test.
- 6L1 cable topology end-to-end return loss test.
- Cleaning material included.
- 6M1 connector inspection probe (optional).

Meets requirements of MIL-STD-1678A and Navy multimode and singlemode launch conditions.

- 6401 singlemode OLTS performance requirements.
 - Configuration A and Configuration B
- 6402 multimode OLTS performance requirements.

Includes required single-strand multimode and singlemode MQJs compliant with NAVSEA Drawing 6877804-05, 6877804-05SME and 6877804-15SME.

FIP-430B-NAV-M2042 inspection probe



Add-on kit provides the capability to inspect the following Navy connector applications:

- M29504/14 & /15 (and other 2 mm) termini installed within or independent of M28876 connectors
- M83522/16 ST connectors (multimode & singlemode) patchcord and bulkhead configurations
- 2.5 mm COTS UPC connectors (i.e., ST, SC, FC) patchcords
- LC (and other 1.25 mm) patchcords
- LC bulkhead adapters

***Testing as described in this document requires the use of two (2) MAX-945-NAV-M2042 units (a Main unit and a Remote unit) located at opposite ends of the cable under test. A "pair" of MAX-945-NAV-M2042-KIT units are required to perform the testing identified.**

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KITCO
fiber optics

Contact us today to get your kit.

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Norfolk, VA 23502

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sales@kitcofo.com
Phone: 757 518-8100



OUR NEWEST TRAINING FACILITY:

1151 Azalea Garden Road, Norfolk



TECHNICAL SERVICES

– Customer Focused Team Driven

**Questions?
Call Technical Services:
(866) 643-5220**

Founded in 1997, KITCO Fiber Optics has 24 years of technical services experience working in the Maritime and Information Technology Industries. KITCO delivers turn-key connectivity solutions to the military and aerospace market. We have earned a leadership position in the fiber optic industry supporting military and specialty customers. Offering our customers unique, focused product and services capabilities for copper, and fiber optic data infrastructure solutions.

KITCO Fiber Optics Field Services provides professional fiber optics and electrical cable and connectivity installation services for aerospace, defense, and harsh environment applications. We primarily support Naval market customers with initial system installs, modernization, repair, testing and trouble shooting.

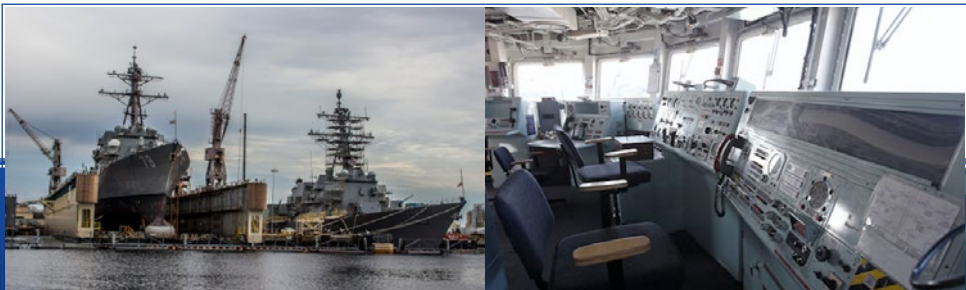
Our in-house trained and certified pool of technicians deliver solutions around the world. We execute this work through direct government contracts and teaming agreements with defense contractors and shipyards. We have program management expertise, and we have a government approved accounting system.

5.2.3.1. Core Module

- A. *Ship Checks and Site Surveys*
- B. *Communications and Network Systems/
Equipment Integration Services and
Upgrades*
- C. *C5ISR Systems Installations and Upgrades*
- D. *Network Solutions and Multi-System Hybrid
System Design and Proof of Concept*
- E. *Navigation and RADAR Systems*
- F. *Installation Design Packages (IDP's)
Development*
- G. *ROI Studies*

Information Technology

- A. *Enterprise level Data Center Design/Build*
- B. *LAN Architecture Design/Build*
- C. *Video-Teleconferencing Suite Design/Build*
- D. *Access Control System Design/Build*
- E. *Secure Conference Facilities Design/build*
- F. *Fiber Optic and Copper Network
Infrastructure Design and Installation
(inside and outside plant)*
- G. *BCSI RCDD on Staff*



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STUDENT TESTIMONIALS

*I've been an instructor for the Navy and have gone through several Navy courses. This was **one of the best**. I learned more in one week here than I did in multiple weeks in other courses. Keep up the good work. Thanks!*

*All topics for this course were taught on a very personal level and easy for anyone to understand. The class environment was **fun**; I greatly enjoyed the teaching style. I've never had such an easy time learning.*

*Best class ever! Frankie was the best instructor ever—very knowledgeable about fiber optics, very **enthusiastic and friendly**.*

*The course was very easy to understand. The labs were very helpful. **The instructor was willing to stay after class** if any additional instruction was required.*

*This course was both challenging and instructive. This is exactly what I wanted. The methods, both the hands-on and the instructor's methods were outstanding—**well worth the cost**.*

*Instructor's training style made it more helpful for me to learn the material. I enjoyed the course greatly. **Labs were very helpful** to learn the material and I appreciated the instructor's desire for our success!*

*Enjoyed the course. I feel that the instructor did a great job of teaching the course. He was very knowledgeable of all the material covered, made the class fun and **entertaining but meaningful at the same time**.*

***The instructor-to-student-ratio is better than most training environments.** Knowledgeable instructors who have the ability to teach at a basic level of understanding.*

*The instructor was extremely knowledgeable and very willing to explain any questions the class had. His teaching skills are outstanding; he knows how to keep things fun and interesting as well as put things in a way that allows an average person to understand. I thoroughly enjoyed and would **recommend this class to anyone wishing to be certified in this field**.*

*The course was **very detailed in all aspects**. **best school I have been to** in my naval career. I feel confident in working with fiber optic cables on my ship.*

*The instructor was outstanding. **The most I have ever learned in a Navy class**. For the first time I feel that I can fully complete the skill sets learned in the fleet. I am looking forward to sending my sailors to this class in the future.*

*Scott is by far the **best instructor I've had** in the military. Considering all of the information required and the amount of time, this class was fun. Fun = better learning. Thank you!*

*Mr. Barks is undoubtedly the SME for fiber. **Outstanding job!***

*The instructor was very knowledgeable about the subject and made it easily understandable, even for people like me with no prior experience. **The hands-on nature of this class is great!***

NAVSEA - Navy Shipboard Fiber Optic Certified Training Program (NSFOCTP)

- **CORE Module (8 hours)**

Includes: Fiber Optic Theory, Safety, Inspection and Cleaning

- **CABLE HANDLING Module (16 hours)**

Includes: Conventional and BOF Cable Handling, Penetration and Repair

- **FORMING Module (8 hours)**

Includes: Forming, Routing and Shaping in an FOICB/ TRB and Cable End Sealing

- **BLOWN OPTICAL FIBER (BOF) Module (32 hours)**

Includes: Tube Furcation, Cable Splicing, BOF Testing, Forming, Shaping and Routing

- **SINGLE FERRULE (SF) Module (8 hours)**

Includes: SF Connector Inspection and Cleaning, SF Connector Termination

- **MULTI TERMINUS (MT) Module (16 hours)**

Includes: MT Connector Inspection and Cleaning, MT Connector Termination

- **FUSION SPLICING Module (8 hours)**

Includes: Fusion Splicing and Preparation and Attachment into a Splice Tray

- **OPTICAL TESTING Module (12 hours)**

Includes: Inspection and Cleaning, Link Loss, Optical Return Loss, Continuity, MQJ Selection, and Attenuation Testing

- **SUPERVISOR/QA Module (32 hours)**

Includes: Core and overview of all modules. Course is instructor led and there is no student hands-on in this training.

6000-2150- Training includes all modules outlined for the Fiber Optic Technician. This course is 80-hours or 10 days, 8-hour days of training. Course includes Core, Cable Handling, Forming, Blown Optical Fiber, Single Ferrule (SF), Multi Terminus (MT), Fusion Splicing, and Optical Testing.

6000-2250- Training is designed to support Fiber Optic Technician that is responsible for terminating and testing fiber optic cable assemblies onboard US Naval Ships. This 5-day, 40-hour course includes the Core, SF module, MT module and Optical Testing modules.

6000-2350- Training is designed to support personnel that are responsible for installing conventional and BOF fiber optic cabling aboard US Naval Ships. The 3.5 day, 28-hour course includes the Core, Cable Handling and Forming modules.

6000-2450- Training is designed to support personnel that are responsible for installing conventional cabling and Blown Optical Fiber (BOF) Cabling. Also includes training for personnel who will be performing Tube Furcation, BOF Testing, Forming and Routing in TRBs and FOICBs. The 5-day, 40-hour course includes the Core, Cable Handling, Forming, and BOF modules.

6000-2900- Training is designed for personnel that work in Quality Assurance (QA) or Supervise fiber optic installations, cable building or testing of fiber topologies. This is a 32-hour, 4-day course and includes the mandatory Core module. This training is demonstration only and is designed for those personnel that are responsible for approving all aspects of the Certified Fiber Optic Installation.

Note: The 32-hour BOF module does not qualify any individual to use the BOF Blow Head or to blow in BOF fiber aboard any US Naval vessel.

CERTIFICATIONS

This course will qualify you for:

GENERAL CABLE:

*1-year Blown
Optical Fiber license*

6000-1165

Blown Optical Fiber (BOF)

COURSE OVERVIEW:

This course provides the student with the history and development of the BOF technology, discusses the advantages and applications of BOF and establishes the “hands-on” experience necessary to properly set up and use the special equipment associated with BOF. Each student will set up the BOF equipment, perform specific maintenance functions on the equipment, and conduct a pre-installation BOF pressure test and projectile test. Once these tests are completed, each student will successfully blow four fibers into the BOF cable plant and perform a seal verification test on a pre-existing terminated BOF cable plant. This module provides each student with the unique experience of troubleshooting an existing BOF cable plant with various pre-installed faults. Each student is required to determine the probable causes and correct the problems. In order to provide the proper “Hands-On” experience for each student. KITCO must hold attendance to 6 students per day.

REQUIRED PREREQUISITES

Before a technician can sign up for the General Cable BOF license course #6000-1165. They must be currently NAVSEA BOF certified (KITCO course 6000-2450) as defined in the MIL-STD 1678 (Requirement 1306), MIL-STD 2042() and NAVSEA Drawing #8477552.

The KITCO BOF course #6000-2450 provides the student with “hands-on” instruction in the techniques and requirements for forming, shaping and routing Blown Optical Fiber (BOF) cable into Tube Routing Boxes (TRBs) and Distribution Boxes (DBs). Topics include: cable entrance to equipment (TRB and DBs), tube forming and shaping, interconnection organization, cable slack requirements, internal tube routing, box marking, BOF tube bend diameters, BOF tube end terminating (hands-on), multiple cable penetrators, nylon stuffing tubes, BOF outer jacket stripping exercise and use of tools (hands-on), forming and shaping into a TRB and DB (hands-on), installation of tube couplers and tees (hands-on), installation of jumpers (hands-on), sealing of BOF tube cables (hands-on) and protection from mechanical damage requirements.

WHO SHOULD ATTEND:

Anyone involved in the installation, maintenance, design, testing or troubleshooting of Blown Optical Fiber topologies onboard U.S. Naval Ships and/or U.S. Naval Submarines or personnel working in the commercial sector involved with any aspect of Blown Optical Fiber Topologies. Technicians and supervisors, who are employed by companies that hold a lease agreement with General Cable to install General Cable's Blown Optical Fiber Tubing, Cable and Fiber. General Cable holds the master license and requires all companies holding lease agreements with them to ensure that their technicians involved in the installation process of Blown Optical Fiber be certified by attending the Installation Course offered solely by KITCO Fiber Optics.

CERTIFICATIONS

This course will qualify you for:

NAVSEA CORE, Cable Handling, Forming and Shaping, Blown Optical Fiber (BOF), Single Ferrule (SF), Multi Terminus MT, Testing, Fusion Splicing, QA. ETA Installer (CFOI) certification (Optional).

6000-2150

Fiber Optic Installer Course

Includes all modules outlined for the Fiber Optic Technician.

This course is 80-hours or 10 days, 8-hour days of training. Course includes Core, Cable Handling, Forming, *Blown Optical Fiber, Single Ferrule (SF), Multi Terminus (MT), Fusion Splicing, and Optical Testing.

▪ **5.2.3.1 CORE Module**

Includes: Theory and Safety

▪ **5.2.3.2 Blown Optical Fiber (BOF) Module**

Includes: Tube Furcation, Cable Splicing, BOF Testing, Forming, Shaping and Routing

▪ **5.2.3.3 Cable Handling, Penetration, and Repair/Modification Module**

Includes: Conventional and BOF Cable Handling, Penetration and Repair

▪ **5.2.3.4 FOICB/TRB Forming, Routing, Shaping Module**

Includes: Forming, Routing and Shaping in an FOICB/ TRB and Cable End Sealing

▪ **5.2.3.5 Fiber Optic Termination - Single Terminus (Light Duty) Module**

Includes: SF Connector Inspection and Cleaning, SF Connector Termination

▪ **5.2.3.6 Fiber Optic Termination - Multi-Terminus (Heavy Duty) Module**

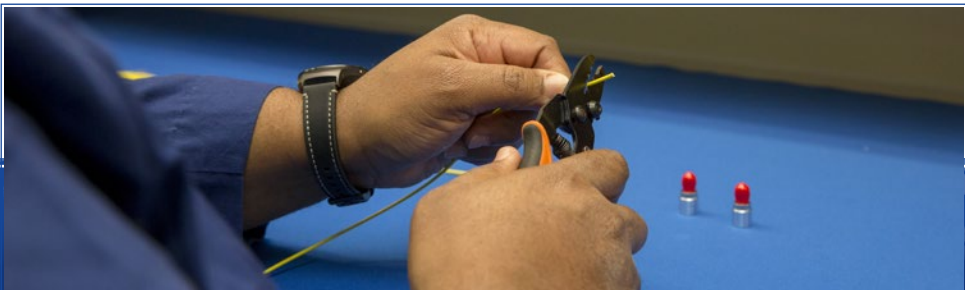
Includes: MT- Connector Inspection and Cleaning, MT Connector Termination

▪ **5.2.3.7 Fiber Optic Termination - Fusion Splicing Module**

Includes: Fusion Splicing and Preparation and Attachment into a Splice Tray

▪ **5.2.3.8 Optical Testing Module**

Includes: Inspection and Cleaning, Link Loss, Optical Return Loss, Continuity, MQJ Selection, and Attenuation Testing



CERTIFICATIONS

This course will qualify you for:

NAVSEA CORE, Single Ferrule (SF), Multi Terminus MT, Testing, ETA Installer (CFOI) certification (Optional).

6000-2250

Fiber Optic Installer Course

This course is designed to support the Fiber Optic Technician that is responsible for terminating and testing fiber optic cable assemblies onboard US Naval Ships. This 5-day, 40-hour course includes the Core, ST module, MT module and Optical Testing modules.

5.2.3.1. Core Module

The Core module is foundational material and is a prerequisite requirement for all other modules.

This curriculum shall include the following topics:

- A. Introduction to and history of Navy Shipboard Fiber Optics
- B. Visual inspection of Fiber Optic components
- C. Information regarding Qualified Products List (QPL) Components
- D. Information regarding the Navy Recommended Fiber Optic Component Parts List
- E. Information regarding the Navy Fiber Optic website
- F. Adherence to all applicable references in Section 2 of NAVSEA Drawing 8477552
- G. Safety requirements when handling fiber
- H. Adherence to MIL-STD-2042C, MIL-STD-2052, MIL-HDBK-2051 and Policy Letters relating to fiber optic system design

5.2.3.5 Fiber Optic Termination- Single Ferrule (Light Duty) Module

The Fiber Optic Termination – Single Ferrule (Light Duty) module is intended to train personnel on how to properly install and repair fiber optic single ferrule connectors in a Navy shipboard environment.

The Fiber Optic Termination – Single Ferrule (Light Duty) module shall include the following topics:

- A. ST Type Connector
- B. Fiber Optic Connector Inspection and Cleaning

The curriculum for this module shall adhere to:

- a. MIL-STD-2042C Part 5, Method 5B1, 5B2, 5B3, 5D3, 6M1
- b. Policy letters relating to fiber optic system design

Information continued on next page.

6000-2250

Fiber Optic Installer Course (Continued)

5.2.3.6 Fiber Optic Termination- Multi-Terminus (Heavy Duty) Module

The Fiber Optic Termination – Multi-Terminus (Heavy Duty) module is intended to train personnel on how to properly install and repair fiber optic multi-terminus connectors in a Navy shipboard environment.

The Fiber Optic Termination-Multi-Terminus (Heavy Duty) module shall include the following topics:

- A. Multi-Terminus (MT)
- B. Heavy Duty Connector Mechanical Pull Test
- C. Fiber Optic Inspection and Cleaning

The curriculum for this module shall adhere to:

- a. MIL-STD-2042C Part 5, Method 5A1, 5A2, 5A3, 5A4, 5A5, 5A6, 5D1, 5D2, 6G1, 6M1
- b. Policy letters relating to fiber optic system design

5.2.3.8 Optical Testing Module

The Optical Testing module is intended to train personnel on how to properly test fiber optic links in a Navy shipboard environment.

The Optical Testing module shall include the following topics:

- A. Cable Assembly Link Loss Test
- B. Cable Attenuation Test
- C. Cable Continuity Test
- D. Cable Topology End-to-End Attenuation Test
- E. Cable Assembly Return Loss Test
- F. Cable Topology End-to-End Return Loss Test
- G. Fiber Optic Connector Inspection and Cleaning
- H. MQJ Selection Test
 - i. MMF
 - ii. SMF

The curriculum for this module shall adhere to:

- a. MIL-STD-2042C Part 6, Methods 6B1, 6C1, 6C2, 6D1, 6E1, 6E2, 6F1, 6K1, 6L1, 6M1



CERTIFICATIONS

This course will qualify you for:

ETA Installer (CFOI)
NAVSEA CORE, Single Ferrule (SF), Multi-Terminus MT, Testing, Fusion Splicing

6000-2265

Fiber Optic Test and Repair (FOTR) Certification Course

The Fiber Optic Technician course is designed to emulate the curriculum being taught at the navy schoolhouses. Our 6000-

2265 course curriculum has been approved by NSWC-DD and the Combat Systems Learning Center. It is listed in the Navy Fiber Optic Training Plan as a commercial equivalent to the CIN: A-670-0063 Fiber Optic Maintenance and Repair course. Unlike the course taught at the schoolhouses, KITCO's 8-day Fiber Optic Technician course provides NAVSEA certifications. Once the course is completed the graduate will receive the following certifications: CORE, Single Ferrule (SF), Multi-Terminus (MT), Testing and Fusion Splicing. This course is also sanctioned by the Electronic Technician's Association (ETA) and each student may take the "optional" commercial Fiber Optic Installer (FOI) certification test.

Unlike the course taught at the schoolhouses, KITCO's 8-day FOTR Technician course also provides NAVSEA certifications. Once the course is completed the graduate will receive the following certifications: CORE, Single Ferrule (SF), Multi-Terminus (MT), Testing and Fusion Splicing. These certifications are good for three (3) years. To recertify in the NAVSEA certifications, the technician will have to contact KITCO to register.

In addition, the 6000-2265 course is also sanctioned by the Electronic Technician's Association (ETA) and each student may take the "optional" commercial Fiber Optic Installer (FOI) certification test. This test is supported by the NAVY COOL program. A sailor can register with NAVY COOL before the class start date and they will pay for the "FOI" certification test (a \$155 dollar value). This certification is good for four (4) years. Recertification can be done with KITCO.

The modules in this course are approved and compliant to meet the NAVSEA Fiber Optic Certification Training requirements as specified and described in: 1) NAVSEA Standard Item 009-123 (FY17) - Fiber Optic System; remove, relocate, repair, and install, 2) NAVSEA Technical Specification 9090-310G - Alterations To Ships Accomplished By Alteration Installation Teams (NO.: TS9090-310G - February 2015), 3) MIL-STD-1678-1 - Fiber Optic Cabling System Requirements and Measurements - Part 1: Design, Installation And Maintenance Requirements, 4) NAVSEA Drawing 8477552 Rev C - Navy Shipboard Fiber Optic Certification Training Program.

Information continued on next page.



6000-2265

Fiber Optic Test and Repair (FOTR) Certification Course (Continued)

The following modules make up the content for the Fiber Optic Technician Certification course:

- **CORE Module (8 hours)**
Includes Theory Inspection, Cleaning and Safety
- **Fiber Optic Termination - Single Terminus (Light Duty) Module (8 hours)**
Includes SF Connector Inspection and Cleaning, SF Connector Termination
- **Fiber Optic Termination - Multi-Terminus (Heavy Duty) Module (12 hours)**
Includes MT Connector Inspection and Cleaning, MT Connector Termination
- **Optical Testing Module (12 hours)**
Includes Inspection and Cleaning, Link Loss, Optical Return Loss, Continuity, MQJ Selection, and Attenuation Testing
- **Fusion Splicing Module (8 hours)**
Includes Cleaving, Splicer Maintenance and Operation, Preparation of Splice Trays, Splicing Methods
- **In addition to the NAVSEA Modules (16 hours)**
This course promotes a thorough understanding of the Optical Time Delay Reflectometer (OTDR) Basic Principles and Operation. Troubleshooting scenarios focus on Systematic Fault Isolation IAW NSTM 408 Fiber Optic Cable Topology manual Method P

6000-2265 Fiber Optic Technician Course - is designed to support the Fleet Fiber Optic Technician that is responsible for maintaining and repairing the fiber optic cable plants aboard U.S. Navy ships and submarines. This 8-day / 64-hour course includes the Core, ST, MT, Fusion Splice and Optical Testing modules. Also included are MTRS documentation and reporting with a focus on advanced troubleshooting techniques. These troubleshooting scenarios will prepare the fleet technician to identify and find faults in the fiber optic cable plants. Providing the sailor with the needed and required skillsets to maintain and repair the ships critical systems.

KITCO's Fiber Optic Technician training course provides a unique "hands-on" experience for the maintainer. All Tooling, Test Equipment and Material are IAW NAVSEA Recommended Lists found on the Navy Shipboard Fiber Optic Website Naval Sea Systems Command > Home > Warfare Centers > NSWC Dahlgren > What We Do > Navy Shipboard Fiberoptics. This course is also available for "on-site" training.

CERTIFICATIONS

This course will qualify you for:

NAVSEA CORE,
Cable Handling,
Forming and Shaping

6000-2350

Fiber Optic Cable Installer Course

This course is designed to support personnel that are responsible for installing conventional and BOF fiber optic cabling aboard US

Naval Ships. The 3.5-day, 28-hour course includes the Core, Cable Handling and Forming modules.

5.2.3.1. Core Module

The Core module is foundational material and is a pre-requisite requirement for all other modules.

This curriculum shall include the following topics:

- A. Introduction to and history of Navy Shipboard Fiber Optics
- B. Visual inspection of Fiber Optic components
- C. Information regarding Qualified Products List (QPL) Components
- D. Information regarding the Navy Recommended Fiber Optic Component Parts List
- E. Information regarding the Navy Fiber Optic website
- F. Adherence to all applicable references in Section 2 of NAVSEA Drawing 8477552
- G. Safety requirements when handling fiber
- H. Adherence to MIL-STD-2042C, MIL-STD-2052, MIL-HDBK-2051 and Policy Letters relating to fiber optic system design

5.2.3.3 Cable Handling, Penetration and Repair Modification module

The Cable Handling, Penetration and Repair/Modification module is intended to train personnel on how to properly handle, penetrate, repair, and modify fiber optic cables in a Navy shipboard environment.

This curriculum shall include the following topics:

- A. Conventional and BOF Cable Handling
- B. Conventional and BOF Cable Penetration
 - i. Nylon Stuffing Tubes
 - ii. Metal Stuffing Tubes
 - iii. Multiple Cable Penetrators (MCP's)
- C. Conventional and BOF Cable Jacket Repair
- D. BOF Cable Splicing
- E. BOF Cable Furcation

The curriculum for this module shall adhere to:

- a. MIL-STD-2042C Part 1, Methods 1B1, 1C1, 1C2, 1D1
- b. MIL-STD-2042C Part 2, Methods 2A1, 2B1, 2B2, 2B3, 2G1, 2H1, 2H2, 2H3
- c. MIL-STD-2042C Part 3, Methods 3A1, 3B1
- d. NSWCDD Fiber Optic Engineering Report, 13 October 2006, Subj: Tube Routing Box (TRB) and Fiber Optic Inter-Connection Box (FOICB) Density Evaluation Laboratory Test Summary
- e. Policy letters relating to fiber optic system design

Information continued on next page.

6000-2350

Fiber Optic Cable Installer Course (Continued)

5.2.3.4 FOICB/TRB Forming, Routing, Shaping module

The FOICB/TRB Forming, Routing, Shaping module is intended to train personnel on how to properly form, route, and shape fiber optic cables within FOICB's and TRB's in a Navy shipboard environment.

This curriculum shall include the following topics:

- A. Conventional Cable
 - i. Cable and OFCC End Sealing
 - ii. Forming, shaping in an FOICB
- B. BOF
 - i. BOF Tube End Sealing
 - ii. 8mm BOF Tube to 5mm BOF Tube Transition within a Protective Enclosure
 - iii. Forming, Routing & Shaping

The curriculum for this module shall adhere to:

- a. MIL-STD-2042C Part 1, Methods 1A1, 1E1
- b. MIL-STD-2042C Part 2, Methods 2C1, 2C2, 2I1, 2I2, 2I3, 2J1, 2K1, 2K2, 2K3, 2L1
- c. NSWCDD Fiber Optic Engineering Report, 13 October 2006, Subject: Tube Routing Box (TRB) and Fiber Optic Inter-Connection Box (FOICB) Density Evaluation Laboratory Test Summary



CERTIFICATIONS

This course will qualify you for:

NAVSEA CORE, Cable Handling, Forming and Shaping, Blown Optical Fiber (BOF).

6000-2450

Fiber Optic Cable Installer & *BOF Course

This course is designed to support personnel that are responsible for installing conventional cabling and Blown Optical Fiber (BOF) Cabling.

Also includes training for personnel who will be performing Tube Furcation, BOF Testing, Forming and Routing in TRBs and FOICBs. The 5-day, 40-hour course includes the Core, Cable Handling, Forming and BOF modules.

This course is made up of the 6000-2350 Cable Handling course plus the 5.2.3.2 Blown Optical Fiber Module.

5.2.3.2 Blown Optical Fiber (BOF) Module

The BOF module is intended to train personnel on how to install, repair, and test BOF in a Navy shipboard environment.

This curriculum will include the following topics:

- A. Cable Handling and Penetration
- B. Forming, Shaping and Routing
- C. 8mm BOF Tube to 5mm BOF Tube Transition within Protective Enclosure
- D. Tube Furcation to include MIL-STD-2042C, Method 2E1 BOF Tube Furcation Fabrication
- E. Testing
 - i. Ball Bearing (BB) Test
 - ii. Cable Pressurization Test
 - iii. Cable Seal Verification Test

The curriculum for the BOF module shall adhere to:

- a. MIL-STD-2042C Part 1, Methods 1B1, 1C1, 1C2, 1D1
- b. MIL-STD-2042C Part 2, Methods 2E1, 2F1, 2F2, 2F3, 2F4, 2G1, 2H1, 2H2, 2H3, 2I1, 2I2, 2J1, 2L1, 2M1
- c. MIL-STD-2042C Part 6, Methods 6H1, 6I1, 6J1
- d. NSWCDD Fiber Optic Engineering Report, 13 Oct 2006, Subj: Tube Routing Box (TRB) and Fiber Optic Interconnection Box (FOICB) Density Evaluation Laboratory Test Summary.
- e. Policy letters relating to fiber optic system design



CERTIFICATIONS

This course will qualify you for:

NAVSEA CORE, Cable Handling, Forming and Shaping, Blown Optical Fiber (BOF).

GENERAL CABLE:
1-year Blown Optical Fiber license

6000-2465

Cable/Blown Optical Fiber (BOF)

Installation Course _____ 40-HOUR COURSE

COURSE OVERVIEW:

This course combines the NAVSEA BOF certification course with the General Cable BOF Installation course. The first four days concentrates on the NAVSEA certification component. This portion includes the "hands-on" instruction in the techniques and requirements for forming, shaping and routing Blown Optical Fiber (BOF) cable into Tube Routing Boxes (TRBs) and Distribution Boxes (DBs). Topics include: cable entrance to equipment (TRB and DBs), tube forming and shaping, interconnection organization, cable slack requirements, internal tube routing, box marking, BOF tube bend diameters, BOF tube end terminating (hands-on), multiple cable penetrators, nylon stuffing tubes, BOF outer jacket stripping exercise and use of tools (hands-on), forming and shaping into a TRB and DB (hands-on), installation of tube couplers and tees (hands-on), installation of jumpers (hands-on), sealing of BOF tube cables (hands-on) and protection from mechanical damage requirements.

The fifth day discusses the history and development of the BOF technology, discusses the advantages and applications of BOF and establishes the "hands-on" experience necessary to properly set up and use the special equipment associated with BOF. Each student will set up the BOF equipment, perform specific maintenance functions on the equipment, and conduct a pre-installation BOF pressure test and projectile test. Once these tests are completed, each student will successfully blow four fibers into the BOF cable plant and perform a seal verification test on a pre-existing terminated BOF cable plant. This module provides each student with the unique experience of troubleshooting an existing BOF cable plant with various pre-installed faults. Each student is required to determine the probable causes and correct the problems.

WHO SHOULD ATTEND:

Anyone involved in the installation, maintenance, design, testing or troubleshooting of Blown Optical Fiber topologies onboard U.S. Naval Ships and/or U.S. Naval Submarines or personnel working in the commercial sector involved with any aspect of Blown Optical Fiber Topologies. Technicians and supervisors who are employed by companies that hold a lease agreement with General Cable to install General Cable's Blown Optical Fiber Tubing, Cable and Fiber. General Cable holds the master license and requires all companies holding lease agreements with them to ensure their technicians involved in the installation process of Blown Optical Fiber be certified by attending an Installation Course offered solely by KITCO™ Fiber Optics.

RECOMMENDED PREREQUISITES:

None. All prerequisites are met within the course.

At KITCO™, we understand the need to provide you with recognized industry certified training. Successful completion of the Blown Optical Fiber Installation Course qualifies you to receive the certifications and license noted.

CERTIFICATIONS

This course will qualify you for:

NAVSEA BOF

GENERAL CABLE:

*1-year Blown
Optical Fiber license*

6000-2466

General Cable/BOF Installation and NAVSEA BOF One Day Difference Course

(Course is limited to a class size of 6 students)

COURSE OVERVIEW:

This course is for the student who has already taken the NAVSEA Cable Handling course 6000-2350. But, still needs the NAVSEA BOF components to achieve the NAVSEA BOF certification that is the prerequisite to get a General Cable Blown Optical Fiber (BOF) license. This course teaches the required BOF methods outlined in the NAVSEA Drawing #8477552 and described in the MIL-STD 2042(). The methods taught are as follows: Methods 2E1, 2F1, 2F2, 2F3, 2F4, 2M1, 6H1, 6I1, and 6J1.

The balance of the course discusses the history and development of the BOF technology, discusses the advantages and applications of BOF and establishes the "hands-on" experience necessary to properly set up and use the special equipment associated with BOF. Each student will set up the BOF equipment, perform specific maintenance functions on the equipment, and conduct a pre-installation BOF pressure test and projectile test. Once these tests are completed, each student will successfully blow four fibers into the BOF cable plant and perform a seal verification test on a pre-existing terminated BOF cable plant. This module provides each student with the unique experience of troubleshooting an existing BOF cable plant with various pre-installed faults. Each student is required to determine the probable causes and correct the problems.

WHO SHOULD ATTEND:

Anyone involved in the installation, maintenance, design, testing or troubleshooting of Blown Optical Fiber topologies onboard U.S. Naval Ships and/or U.S. Naval Submarines or personnel working in the commercial sector involved with any aspect of Blown Optical Fiber Topologies. Technicians and supervisors who are employed by companies that hold a lease agreement with General Cable to install General Cable's Blown Optical Fiber Tubing, Cable and Fiber. General Cable holds the master license and requires all companies holding lease agreements with them to ensure that their technicians involved in the installation process of Blown Optical Fiber be certified by attending an Installation Course offered solely by KITCO™ Fiber Optics.

RECOMMENDED PREREQUISITES:

None. All prerequisites are met within the course.

At KITCO™, we understand the need to provide you with recognized industry certified training. Successful completion of the Blown Optical Fiber Installation Course qualifies you to receive the certifications and license noted.

CERTIFICATIONS

This course will qualify you for:

QA/Supervisor

6000-2900

Supervisor and Quality Assurance (QA) Course

This course is designed for those personnel who are responsible for approving all aspects of the Certified Fiber Optic Installation.

This is a 32-hour, 4-day course that includes the Core module.

All personnel that currently have the potential of Supervising or performing QA inspections of Navy shipboard fiber optic installations in any form (e.g., blowing fiber, pulling fiber, installing connectors, installing fiber optic interconnection boxes, testing fiber optic links, etc.) shall obtain Navy shipboard fiber optic training from a training organization included on the Certified Fiber Optic Training List (CFOTL). KITCO™ Fiber Optics is pleased to announce we were the first company to be approved to offer this training, and we are on the CFOTL. Each individual fiber optic Supervisor or QA inspector shall have an up-to-date certification for the work they are performing from a certified training organization on the CFOTL. Fiber Optic Supervisor or QA inspector personnel shall obtain Navy shipboard fiber optic training (CLASSROOM ONLY) in the following areas:

(Core module included with each):

- 5.2.3.1 Core
- 5.2.3.2 Blown Optical Fiber (BOF)
- 5.2.3.3 Cable Handling, Penetration, and Repair/Modification
- 5.2.3.4 FOICB/TRB Forming, Routing, Shaping
- 5.2.3.5 Fiber Optic Termination – Single Terminus (Light Duty)
- 5.2.3.6 Fiber Optic Termination – Multi-Terminus (Heavy Duty)
- 5.2.3.7 Fiber Optic Termination – Fusion Splicing
- 5.2.3.8 Optical Testing

Each individual fiber optic Supervisor or QA inspector shall present their training certification card, upon request, while performing Navy shipboard fiber optic work. The certification shall remain valid for 3 years before requiring recertification.

CERTIFICATIONS

This course will qualify you for:

NAVSEA CORE, Single Ferrule (SF) Testing.
ETA Installer (CFOI) certification (Optional).

6000-1310

Shipboard 38999 Connector Course

40-HOUR COURSE

COURSE OVERVIEW:

Our Shipboard 38999 Connector Course is designed to meet the requirements of military installations onboard ships. Students will terminate a variety of ST, SC and FC connectors as well as M29504/4 and M29504/5 terminus pins and sockets. Industry standards including those of the Telecommunications Industry Association/ Electronics Industries Alliance (TIA/ EIA) and the National Electrical Code (NEC) are incorporated into the training and students are offered the option of taking the Electronics Technicians Association (ETA) Certified Fiber Optic Installer (CFOI) exam.

WHO SHOULD ATTEND:

Our course is designed for those students who will be installing and maintaining fiber optic systems and equipment on naval ships. After completing this course, each student will be able to successfully install, test and troubleshoot fiber optic cables and systems onboard naval ships. Students will become proficient in the termination processes for a variety of connectors used on various Shipboard Systems.

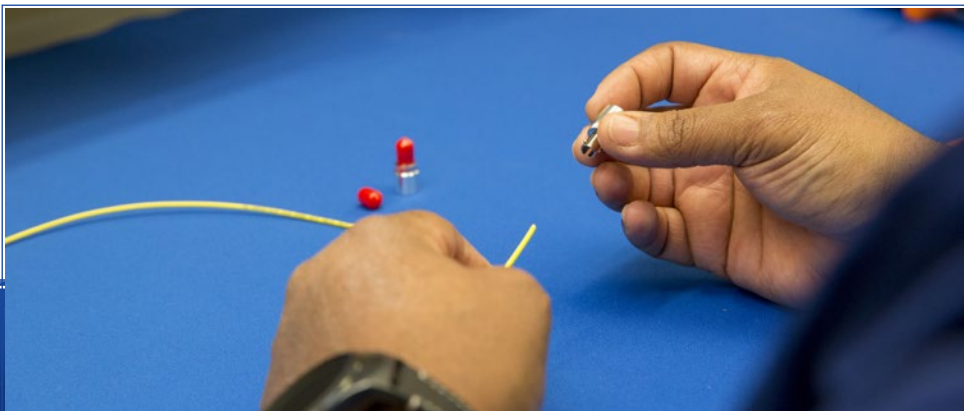
RECOMMENDED PREREQUISITES:

None. Successful completion of the 5-day course and test qualifies you for the certifications noted.

ETA CFOI CERTIFICATION (OPTIONAL):

For an additional fee of \$150.00 we will administer the ETA Certified Fiber Optic Installer (CFOI) exam. Upon successful completion you will be certified as an ETA Certified Fiber Optic Installer.

ALL COURSE MATERIAL INCLUDED. ETA TESTING (CFOI); \$155.00



6000-1400

Hermaphroditic Connector Course

16-HOUR COURSE

CERTIFICATIONS

This course will qualify you for:

**APTIV/DELPHI
CERTIFICATE**

KITCO™:
Completion Certificate

Delphi's Harsh Environment Hermaphroditic Fiber Optic Connectors provide consistent optical performance when utilized in the harshest environments. They are available in 4-, 6-, and 12-channel configurations for both military and commercial applications. Military applications include pier-side connectivity (ViViD) and tactical field use.

COURSE OVERVIEW:

KITCO's 2-day course is designed to meet the requirements of both military and commercial applications. Our mission is to provide our students with the hands-on knowledge and ability to successfully terminate and test a hermaphroditic connector.

WHO SHOULD ATTEND:

Anyone involved in design, configuration, installation, testing, troubleshooting or fiber optic system maintenance: technicians, system analysts, design engineers, managers, telecommunication professionals, etc.

RECOMMENDED PREREQUISITES:

5-Day NAVSEA 6000-2250 Terminate and Test

At KITCO™, we understand the need to provide you with recognized industry certified training. Our 2-day Hermaphroditic Connector Course will qualify you for the certifications noted.



6000-5000

Multi-Pin Copper Connector Course

This course meets the requirements of NAVSEA standard item 009-73 and MIL-STD-2003-5A. 009-73 graph 4.5.1 Connector fabricator qualification requirement is the successful completion of the formal training course (32 hours) plus successful completion of 40 hours of on-the-job training under the tutelage of a qualified connector fabricator or a qualified fabrication supervisor in the type of connector to be fabricated, either electrical or electronic.

Our course meets the requirement stated above plus provides 8 hours of specialized training on low voltage and data connectors commonly used on naval ships and submarines. Once the trainee completes the 40-hour course they will be "qualified" on all connectors listed in the MIL-STD-2003-5A. The technician will receive a card stating they are qualified (8 hours are applied to the 40 hours of mandated OJT during the course). Once the technician obtains 32 additional documented hours of OJT the company/organization will submit to KITCO™ proof of those hours and the technician will now be recognized as a "Fully Qualified Connector Fabricator" and receive their certification card. KITCO's courses have been developed in strict adherence to the requirements identified in the applicable document listed above. KITCO™ Fiber Optics has met all NAVSEA requirements to provide this shipboard copper training.

The following connectors make up the content for the NAVSEA qualification requirements:

- a. *MIL-C-81511 Series 1 and 2 Gang Contact Release Connector Assembly*
- b. *MIL-DTL-5015 Connectors*
- c. *MIL-DTL-26482 Connectors*
- d. *MIL-DTL-28840 Connectors*
- d. *MIL-DTL-27599 Connectors*
- d. *MIL-DTL-22992 Connectors*
- d. *MIL-DTL-38999 Connectors*
- d. *RJ-45 Connectors*

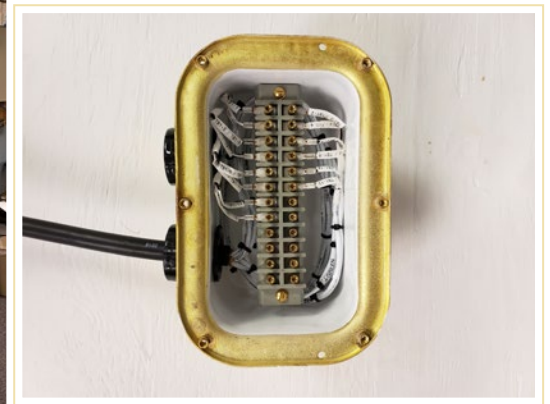
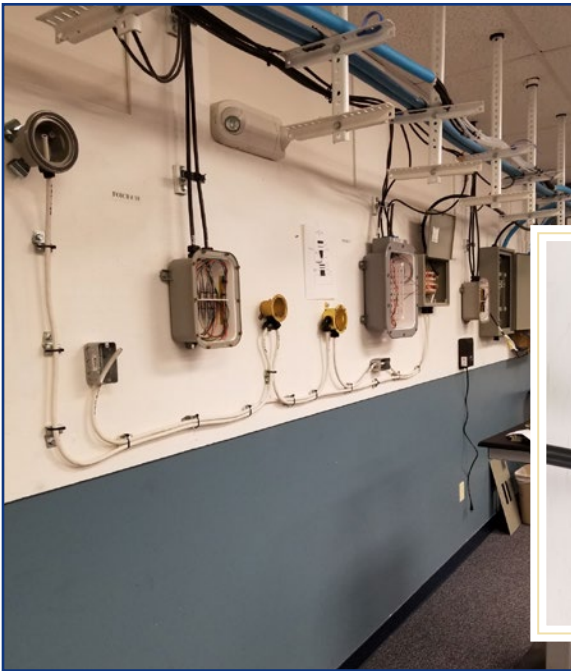
This is mandatory training for any person that currently is or has the potential to perform Navy Shipboard multi-pin connector installations. These personnel include (but are not limited to) supervisors, QA inspectors, installers/technicians employed by: Ship Builders, SUPSHIP, and Government/Contracted Installation/Repair Teams, AIT's, Ship/Planning Yards, OSR's, RMC's, FMA's, ISEA'S and Industrial Activities.

6000-5010

Copper Cableway Course

This course meets the requirements of NAVSEA Standard Item 009-73 and MIL-STD-2003-4A. 009-73 paragraph 4.5.1 Our course combines instructor lead classroom lectures, videos and hands-on labs where the students will install a wiring system from the power panel through a distribution box, switch, receptacle and light fixture. Students will learn how to use a multimeter and Megger to validate the cables.

Once students complete our copper cableway course, they will receive a NAVSEA Cableway certification card. Topics include: Stuffing Tubes, Multicable Penetrators, Dead-end Cable, Cable Splicing, Chafing Rings, Hangars, Banding, Removal and Installation Techniques, Penetration of Equipment and Connections, Repairing Insulation Damage, Testing Cables, Special Tools and Equipment, Wiring Techniques and Inspection of Cableways.



KITCO cableway training provides a unique “hands-on” experience for the technician with our classroom Mock-ups.”

10-HOUR MARITIME: SHIPYARD EMPLOYMENT COURSE

10-HOUR COURSE

COURSE OVERVIEW:

Our Maritime 10-hour safety course is designed to meet shipyard requirements for the 10-hour safety course mandate. Students will participate in a minimum of 10 hours of class room training to include: introduction to OSHA, walking and working surfaces, PPE, fall protection, shipyard Electrical safety, confined and enclosed space safety, fire protection in shipyards, lockout/tagout of hazardous energy sources and ergonomics & proper lifting techniques.

WHO SHOULD ATTEND:

Our course is designed for students who will be installing and maintaining shipboard equipment and systems on Naval ships. After completing this course each student will be able to identify potential hazards and avoid injury.

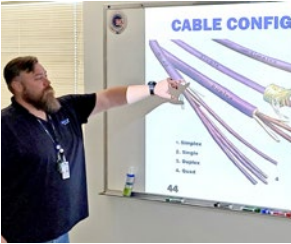
RECOMMENDED PREREQUISITES:

None. Successful completion qualifies the student to earn an OSHA 10 Hour Shipboard Employment safety card.

OSHA SAFETY CARD EARNED



Learn from the Fiber Experts



KITCO Fiber Optics' hands-on training and advanced certification programs have become the hallmarks of our superior reputation. We offer training at our main facility in Norfolk, Virginia or at your place of business through or mobile training services.

KITCO's instructors have spent thousands of hours in the field terminating and testing, consulting and teaching fiber optics to students around the globe. We never subcontract our training services. Our highly qualified instructors are full-time KITCO employees whose experience and industry certifications ensure you the most valuable hands-on fiber education currently available.

We train using a full inventory of non vendor specific tool kits and test equipment. In KITCO's hands-on courses, you'll train on the most advanced equipment experiencing a large variety of connectors, Light Sources, Power Meters, Optical Talk Sets, Optical Time Domain Reflectometers (OTDR), Fusion Splicers, Visual Fault Locators (VFL), curing ovens, equipment racks and interconnection boxes. But when required, our instructors can train you on your own tools and test equipment - tailoring our approach to meet your needs.



Benefit from KITCO's Mobile Training & Custom Courses

KITCO'S SUPERIOR HANDS-ON TRAINING PROGRAMS CAN AFFORDABLY HAVE YOU UP TO SPEED AND CERTIFIED IN A WEEK OR LESS!

- 5 DAY MILITARY or COMMERCIAL
- 3 DAY AVIATION INSPECTION, CLEANING & TESTING
- 4 DAY F-35 SPECIFIC INSPECTION, CLEANING & TESTING
- 5 DAY E2, P8, FA-18, & F-15 SPECIFIC TRAINING

KITCO's training courses are industry recognized and approved for MIL-STD-1678, SAE ARP5602, and ARINC 805/807 Reports. Industry standards, including those of the Telecommunications Industry Association/Electronic Industry Alliance (TIA/EIA), are incorporated into KITCO's courses and students are offered the option of taking the Electronics Technician Association (ETA) Aerospace FO Fabricator (SAEFAB), FO Evaluation & Enface Cleaning (FECC), Aerospace FO Technician/Installer (AFT/AFI) certification exams.



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CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC 3-YEAR "CRAFTSMAN" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION: See below (Optional)

6000-1300

Military Aviation Technician's Course

40-HOUR COURSE

COURSE OVERVIEW:

Our Certified Military Aviation Courses are designed to meet the requirements of the SAE ARP5602 (Society of Automotive Engineers) Knowledge Competencies and Skill Set requirements as well as the NAVAIR NA-01-1A-505-4 (Military Aircraft Fiber Optic Cabling). Students who complete this training are eligible to take the Aerospace Fiber Optic Installer examination (AFI108), the Aerospace Fiber Optics Technician examination (AFT107) or the Aerospace Fiber Optics fabricator examination (SAEFAB). In addition, all aviation students may take the Fiber Optic Evaluation and Endface Cleaning examination (FEEC117) based on the ARINC 805 standard.

This course teaches the following connectors and termini:

MILSPEC

- ST Connectors
- LC Connectors
- M29504/4 Termini Oin (Style 1)
- M29504/5 Termini Socket (Style 1)
- D38999 Multi-Terminus circular connectors

Note: Custom connector training can be on a case-by-case basis. Let us know your particular requirements. Custom courses will be priced accordingly.

WHO SHOULD ATTEND:

Our course is designed for those students who will be installing, connecting, cleaning and evaluating, repairing, testing and troubleshooting fiber optic systems and equipment on military aircraft. After completing this course, each student will be able to install and maintain fiber optic cables and systems onboard military aircraft.

According to MIL-STD 1678 the training required to work on military aircraft is as follows:

Actions shall be taken to ensure personnel are trained by training organizations certified for the training required proficiency skill sets. Organizations shall ensure that military maintainers, depot artisans, prime and sub-prime contractors, and others within the fiber optic community (both Governments and commercial) have initial and maintain an adequate skill set for their

Information continued on next page.

6000-1300

Military Aviation Technician's Course (*Continued*)

assigned fiber optic responsibilities. Implement reoccurring training or otherwise augment as needed to ensure skill set sustainment. Perishable skill sets are those that are lost or degraded rapidly (usually within months) if not practiced or performed. On military platforms, the fiber optic cable assemblies intended to be inspected and maintained are cable harnesses, (1) equipment (electronic module/package) such as an ATC, LRC, LRM, LRU or WRA with internal fiber optics, (2) circuit card modules and assemblies with internal optics, and (3) other miscellaneous cabling.

RECOMMENDED PREREQUISITES:

Successful completion of the knowledge competencies and skill sets as set forth in the ARP5602 and qualifies you to take the following ETA (Electronics Industry Association) exams:

- Aerospace Fiber Optic Installer examination (AFI108) based on SAE ARP5602
- Aerospace Fiber Optics Fabricator examination (SAEFAB) based on SAE ARP5602
- Aerospace Fiber Optics Technician examination (AFT107) based on SAE ARP5602
- Fiber Optics Evaluation and Endface Cleaning examination (FEEC117) based on the ARINC 805 standard.

Note: There is an additional \$180.00 fee to participate in each examination.

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "CRAFTSMAN" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION:

See below (Optional)

6000-1330

Commercial Aviation Technician's Course

40-HOUR COURSE

COURSE OVERVIEW:

Our certified Commercial Aviation Technician's Fiber Optic Course is designed to meet the AIRINC 807-3 (Aircraft Radio Incorporated) Knowledge Competencies and Skill Sets associated with Commercial Aviation Fiber Optic training. Those who complete the course have the choice of taking the Aerospace Fiber Optics fabricator examination (SAEFAB). In addition, all aviation students may take the Fiber Optics Evaluation and Endface Cleaning examination (FEEC117) based on the ARINC 805 standard.

This training course covers the following Commercial Aviation fiber optic connectors/termini:

Commercial

- LC Connectors
- ST Connectors
- ARINC 801 Termini (Loose-Structure)
- EN4531 ELIO Termini
- MIL-DTL38999 Circular Connectors

Note: Custom connector training can be on a case-by-case basis. Let us know your particular requirements. Custom courses will be priced accordingly.

WHO SHOULD ATTEND:

Our course is designed for those students who will be installing and maintaining fiber optic systems and equipment on commercial aircraft. After completing this course, each student will be able to install, connect, repair, evaluate and clean, test and troubleshoot fiber optic cables and systems onboard commercial aircraft.

RECOMMENDED PREREQUISITES:

Successful completion of the knowledge competencies and skill sets as set forth in the ARP5602 and qualifies you to take the following ETA (Electronics Industry Association) exams:

- Aerospace Fiber Optic Installer examination (AFI108)
- Aerospace Fiber Optics Fabricator examination (SAEFAB)
- Aerospace Fiber Optics Technician examination (AFT107)
- Fiber Optics Evaluation and Endface Cleaning examination (FEEC117) based on the ARINC 805 standard.

Note: There is an additional \$180.00 fee to participate in each examination.

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "CRAFTSMAN" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION: *See below (Optional)*

6000-1410

E2D Platform Specific Course

COURSE OVERVIEW:

Our Certified Aviation E2D Specific Course is designed to meet the MIL-STD-1678 training requirements, SAE ARP5602 (Society of Automotive Engineers), the NAVAIR NA-01-1A-505-4 (Military Aircraft Fiber Optic Cabling) and the ARINC 805 Inspection / Cleaning and Testing requirements and Knowledge Competencies. This course teaches the following:

Aviation Fiber Optic Theory and Fundamentals

Terminating the following connectors: ST connectors to the following: ARINC 801, M29504/15, and M29504/5 style 1 on aviation loose structure cable. The students will also build a single mode ST to ST on tight structure cable

Inspection and Cleaning practices on single ferrule connectors and termini, multi-terminus connectors, and use of the fiber optic video inspection probe (FOVIS)

Testing theory and practices including Link Loss, and Optical Return Loss Testing in accordance with the NA-01-1A-505-4. Troubleshooting procedures and best practices. Test equipment students will use; Optical Light Source and Power Meters, Optical Return Loss Meter, Visual Fault Locator, Video Inspection Probes, and 400x/200x Microscopes.

REQUIRED PREREQUISITES:

None

WHO SHOULD ATTEND:

Our Course is designed for those students who will be terminating, installing, routing, and mate/demating connectors. Evaluating, cleaning, and troubleshooting fiber optic systems and equipment on E2D aircraft. After completing this course, each student will be able to install, test and troubleshoot fiber optic cables and systems onboard military aircraft, specifically the E2D platform.

Successful completion of the knowledge competencies and "hands-on" skillsets qualifies each student to take ETA (Electronics Industry Association) SAEFAB Aerospace Fiber Optics Fabricator examination based on the SAE/ARINC requirements: Test is included in price of the course.

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "CRAFTSMAN" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION: *See below (Optional)*

6000-1415

P8 Platform Specific Course

COURSE OVERVIEW:

Our Certified Aviation P8 Specific Course is designed to meet the MIL-STD-1678 training requirements, SAE ARP5602 (Society of Automotive Engineers), the NAVAIR NA-01-1A-505-4 (Military Aircraft Fiber Optic Cabling) and the ARINC 805 Inspection / Cleaning and Testing requirements and Knowledge Competencies. This course teaches the following:

Aviation Fiber Optic Theory and Fundamentals

Terminating the following connectors: ST connectors to the following: ARINC 801 and LC connectors, M29504/4 style 1 and M29504/5 style 1 on aviation loose structure double jacketed cable in accordance with the P8 Boeing Manual. The students will also build a single mode ST to ST on tight structure cable

Inspection and Cleaning practices on single ferrule connectors and termini, multi-terminus connectors, and use of the fiber optic video inspection probe (FOVIS)

Testing theory and practices including Link Loss, and Optical Return Loss Testing in accordance with the NA-01-1A-505-4. Troubleshooting procedures and best practices. Test equipment students will use; Optical Light Source and Power Meters, Optical Return Loss Meter, Visual Fault Locator, Video Inspection Probes, and 400x/200x Microscopes.

REQUIRED PREREQUISITES:

None

WHO SHOULD ATTEND:

Our Course is designed for those students who will be terminating, installing, routing, and mate/de-mating connectors. Evaluating, cleaning, and troubleshooting fiber optic systems and equipment on P8 aircraft. After completing this course, each student will be able to install, test and troubleshoot fiber optic cables and systems onboard military aircraft, specifically the P8 platform.

Successful completion of the knowledge competencies and "hands-on" skillsets qualifies each student to take ETA (Electronics Industry Association) SAEFAB Aerospace Fiber Optics Fabricator examination based on the SAE/ARINC requirements: Test is included in price of the course.

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "CRAFTSMAN" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION:

See below (Optional)

6000-1420

FA-18 Platform Specific Course

COURSE OVERVIEW:

Our Certified Aviation FA-18 Specific Course is designed to meet the MIL-STD-1678 training requirements, SAE ARP5602 (Society of Automotive Engineers), the NAVAIR NA-01-1A-505-4 (Military Aircraft Fiber Optic Cabling) and the ARINC 805 Inspection / Cleaning and Testing requirements and Knowledge Competencies. This course teaches the following:

Aviation Fiber Optic Theory and Fundamentals

Terminating the following connectors: ST connectors to the following: M29504/4 style 1, M29504/5 style1, M29504/4 style 2, and M29504/5 style 2 on aviation loose structure and tight structure cable

Inspection and Cleaning practices on single ferrule connectors and termini, multi-terminus connectors, and use of the fiber optic video inspection probe (FOVIS)

Testing theory and practices including Link Loss Testing and Troubleshooting procedures and best practices. Test equipment students will use; Optical Light Source and Power Meters, Visual Fault Locator, Video Inspection Probes, and 400x/200x Microscopes.

REQUIRED PREREQUISITES:

None

WHO SHOULD ATTEND:

Our Course is designed for those students who will be terminating, installing, routing, and mate/demating connectors. Evaluating, cleaning, and troubleshooting fiber optic systems and equipment on FA-18 aircraft. After completing this course, each student will be able to install, test and troubleshoot fiber optic cables and systems onboard military aircraft, specifically the FA-18 platform.

Successful completion of the knowledge competencies and "hands-on" skillsets qualifies each student to take ETA (Electronics Industry Association) SAEFAB Aerospace Fiber Optics Fabricator examination based on the SAE/ARINC requirements: Test is included in price of the course.

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "CRAFTSMAN" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION:

See below (Optional)

6000-1430

F-15 Platform Specific Course

COURSE OVERVIEW:

Our Certified Aviation F-15 Specific Course is designed to meet the MIL-STD-1678 training requirements, SAE ARP5602 (Society of Automotive Engineers), the TO 1-1A-14-4 (Military Aircraft Fiber Optic Cabling) and the ARINC 805 Inspection/Cleaning and Testing requirements and Knowledge Competencies. This course teaches the following:

Aviation Fiber Optic Theory and Fundamentals

Terminating the following connectors: ST connectors to the following: M29504/4 style 1, M29504/5 style1, M29504/4 style 2, and M29504/5 style 2 on aviation loose structure and tight structure cable

Inspection and Cleaning practices on single ferrule connectors and termini, multi-terminus connectors, and use of the fiber optic video inspection probe (FOVIS)

Testing theory and practices including Link Loss Testing and Troubleshooting procedures and best practices. Test equipment students will use; Optical Light Source and Power Meters, Visual Fault Locator, Video Inspection Probes, and 400x/200x Microscopes.

REQUIRED PREREQUISITES:

None

WHO SHOULD ATTEND:

Our Course is designed for those students who will be terminating, installing, routing, and mate/demating connectors. Evaluating, cleaning, and troubleshooting fiber optic systems and equipment on F-15 aircraft. After completing this course, each student will be able to install, test and troubleshoot fiber optic cables and systems onboard military aircraft, specifically the F-15 platform.

Successful completion of the knowledge competencies and "hands-on" skillsets qualifies each student to take ETA (Electronics Industry Association) SAEFAB Aerospace Fiber Optics Fabricator examination based on the SAE/ARINC requirements: Test is included in price of the course.

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "INTERMEDIATE" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION:

See below (Optional)

6000-1490

Aviation Certified Inspection, Cleaning, and Test Course Overview

COURSE OVERVIEW:

Our Certified Aviation Course is designed to meet the MIL-STD-1678, SAE ARP5602 (Society of Automotive Engineers), the NAVAIR NA-01-1A-505-4 (Military Aircraft Fiber Optic Cabling) and the ARINC 805 Inspection / Cleaning and Testing requirements and Knowledge Competencies. This course teaches the following:

Aviation Fiber Optic Theory and Fundamentals

Inspection and Cleaning practices on single ferrule connectors and termini, multi-terminus connectors (D38999, ARINC 600, and EPX connectors), use of the fiber optic video inspection probe (FOVIS)

Testing theory and practices including Link Loss Testing and Troubleshooting procedures and best practices. Test equipment students will use are Optical Light Source and Power Meters, Visual Fault Locator, Video Inspection Probes, and 400x / 200x Microscopes.

REQUIRED PREREQUISITES:

None

WHO SHOULD ATTEND:

Our Course is designed for those students who will be installing routing, mating/de-mating connectors, evaluating, cleaning and troubleshooting fiber optic systems and equipment on military aircraft. After completing this course, each student will be able to install, test and troubleshoot fiber optic cables and systems onboard military aircraft. This course is designed to aid the flightline technician in keeping "fully mission capable" aircraft.

Upon Completion:

Successful completion of the knowledge competencies and "hands-on" skillsets qualifies each student to take ETA (Electronics Industry Association) FECC Certified Fiber Optics Evaluation and End-face Cleaning examination based on ARINC 805 requirements: Test is included in price of the course. This course satisfies the MIL-STD-1678 through the level of "Intermediate Skill Set".

CERTIFICATIONS

This course will qualify you for:

KITCO FIBER OPTIC'S 3-YEAR "INTERMEDIATE" CERTIFICATION:

Based on the requirements listed in MIL-STD 1678, Requirement 1306 Table I and II

ETA CERTIFICATION:

See below (Optional)

6000-1495

Aviation Certified F35 Specific Inspection, Cleaning, and Test Course

COURSE OVERVIEW:

Our Certified Aviation Course is designed to meet the MIL-STD-1678, SAE ARP5602 (Society of Automotive Engineers), the NAVAIR NA-01-1A-505-4 (Military Aircraft Fiber Optic Cabling) and the ARINC 805 Inspection / Cleaning and Testing requirements and Knowledge Competencies. This course teaches the following:

Aviation Fiber Optic Theory and Fundamentals

Inspection and Cleaning practices on MTP/MPO, single ferrule connectors, termini, and multi-terminus connectors (D38999, ARINC 600, and EPX connectors), use of the fiber optic video inspection probe (FOVIS)

Testing theory and practices including Link Loss Testing and Troubleshooting procedures and best practices. Test equipment students will use are Optical Light Source and Power Meters, Visual Fault Locator, Video Inspection Probes, and 400x / 200x Microscopes. Particular attention will be given to F-35 equipment and testing principles.

REQUIRED PREREQUISITES:

None

WHO SHOULD ATTEND:

Our Course is designed for those students who will be installing routing, mating/de-mating connectors, evaluating, cleaning and troubleshooting fiber optic systems and equipment on military aircraft including the F35. After completing this course, each student will be able to install, test and troubleshoot fiber optic cables and systems onboard military aircraft. This course is designed to aid the flightline technician in keeping "fully mission capable" aircraft.

UPON COMPLETION:

Successful completion of the knowledge competencies and "hands-on" skillsets qualifies each student to take ETA (Electronics Industry Association) FECC Certified Fiber Optics Evaluation and End-face Cleaning examination based on ARINC 805 requirements: Test is included in price of the course. This course satisfies the MIL-STD-1678 through the level of "Intermediate Skill Set".

CERTIFICATIONS

This course will qualify you for:

KITCO™:
Completion Certificate

CORNING:
Factory Certificate

**ETA CFOI/CFOT
CERTIFICATION:**
(Optional)

6000-1050

Commercial Technician Course

40-HOUR COURSE

CORNING

**KITCO™ HAS PARTNERED WITH CORNING TO ENHANCE OUR
COMMERCIAL TECHNICIAN FIBER OPTIC TRAINING COURSE
FOCUSING ON INSIDE PLANT INSTALLATIONS**

COURSE OVERVIEW:

KITCO™ has added the Corning Unicam, FuseLite splice-on connectors and Splice Cassettes to our inside plant training course. Our mission is to provide our students with the BEST hands-on experience and knowledge for them to be successful in terminating a variety of connectors in the field such as STs, SCs, and LCs. The technician will be exposed to epoxy, Hot-Melt, crimp-on (NENP) and splice-on connector termination techniques. Students will perform fusion splicing and mechanical splicing in a splice tray. Additionally, students are taught how to clean, inspect, test and troubleshoot fiber optic cables and cable plants using the Optical Time Domain Reflectometer (OTDR), Optical Loss Test Set (OLTS), Optical Return Loss Meter (ORLM) and the Visual Fault Locator (VFL).

WHO SHOULD ATTEND:

Anyone involved in design, configuration, installation, testing, troubleshooting or fiber optic system maintenance: technicians, system analysts, design engineers, managers, telecommunication professionals or anyone providing oversight, etc.



6000-1050

Commercial Technician Course (Continued)

RECOMMENDED PREREQUISITES:

NONE. At KITCO™ our instructors are factory-trained technicians and fiber optic Subject Matter Experts (SMEs). We understand the need to provide you with recognized industry qualifications and certifications. Our 5-day Certified Technician Course will provide you with the qualifications noted and the proven skillsets and knowledge to take the ETA certification tests.

ETA CERTIFICATION(S):

Electronics Technician's Association (ETA) exams are optional; they offer a great opportunity to become certified by an internationally renowned organization. Our course curriculum is approved to allow the student to take both the Fiber Optic Installer (FOI) and Journeymen Technician Certification Tests (FOT). Fiber optic examinations are available for an additional fee of \$155 each.

ETA EXAM (CFOI): \$155.00

ETA EXAM (CFOT): \$155.00

IN ORDER TO BECOME CERTIFIED AS A FIBER OPTIC TECHNICIAN. YOU MUST PASS THE PREREQUISITE FIBER OPTIC INSTALLER EXAMINATION. CERTIFICATIONS ARE GOOD FOR 4 YEARS.



CERTIFICATIONS

This course will qualify you for:

KITCO™:
Completion Certificate

ETA CFOI CERTIFICATION:
(Optional)

6000-1460

Tactical Fiber Optic Cable Assembly Course

40-HOUR COURSE

Our 5-day Tactical Fiber Optics Course is designed for personnel who are responsible for maintaining tactical fiber optic cable reel assemblies. This course is similar to the program we developed for the U.S. Army's Patriot System Fiber Optic Repair course taught at USAOMEMS in Ft Bliss, TX, and is taught in strict adherence to MIL-STD-2042 (). All of our instructors have real world experience, having spent literally thousands of hours terminating, splicing and testing fiber optic cable systems.

COURSE OVERVIEW:

Students who successfully complete our training course will have the experience and confidence to terminate Single Terminus (ST), Multiple Terminus (MT) connectors, Biconic Connectors and 4-channel M83526 connectors. Students will also learn to properly inspect, test, troubleshoot and repair tactical fiber optic cable reel assemblies in accordance with MIL-STD-2042 () using Optical Time Domain Reflectometers, Light Source and Power Meters and Visual Fault Locators. Students will also learn to repair damaged cable by removing the bad cable, fusion splice the cable together and protect it with a splice protection sleeve and splice enclosure.

WHO SHOULD ATTEND:

Anyone involved with the installation of fiber optic components, testing, and troubleshooting harsh environment tactical fiber optic cable assemblies.

RECOMMENDED PREREQUISITES:

None. At KITCO™, we understand the need to provide you with recognized industry certified training. Successful completion of the 5-day course and test qualifies you to receive the certifications noted.

ETA CFOI CERTIFICATION (OPTIONAL):

Students are offered the option of taking the Electronics Technicians Association (ETA) Certified Fiber Optic Installer (CFOI) exam for an additional fee of \$155.00. Upon successful completion, you will be certified as an ETA Certified Fiber Optics Installer.



ETA CERTIFICATION

ETA (ELECTRONICS TECHNICIANS ASSOCIATION)

Since 1978, the Electronics Technicians Association, International (ETA) has certified thousands of electronics technicians worldwide who excel in areas of electronics installation, service and support. An electronics technician who successfully passes an ETA certification program is professionally recognized as having the ability to uphold the necessary de facto electronics industry standards.

The ETA is an independent electronics certification and testing organization dedicated to serving the needs and interests of electronics technicians worldwide.

ETA FIBER OPTIC INSTALLER CERTIFICATION

ETA's Fiber Optics Installer Certification (FOI) Program represents the fiber industry's most advanced and comprehensive method of certifying technicians in the world's fastest growing field: Fiber Optics Installation.

ETA certified technicians are professionally recognized as having the necessary knowledge and technical skills to meet international de facto electronics industry standards. Wearing CFOI after your name implies that you are a skilled artisan. Businesses displaying CFOI certificates provide customer assurance. CFOIs get hired first by thousands of employers.

ETA CERTIFIED FIBER OPTIC TECHNICIAN CERTIFICATION

An electronics technician who successfully passes an ETA certification exam is recognized as having the necessary knowledge and technical skills to meet international standards. ETA Certified Technicians are on the fast track when it comes to employment and professional advancement. They are recognized worldwide.

ETA AVIATION CERTIFICATIONS

All ETA Aviation Certifications meet the requirements of SAE and ARINC standards for military and commercial applications.

ETA RECERTIFICATION

Having met the requirements of the ETA Fiber Optics Installation Certification, it must be renewed every four years. ETA certification is awarded to individuals, not organizations or institutions. Your certification is personal and is a professional accomplishment. If you leave any organization or institution, you retain your certification along with all its benefits.

EXAM FEES

Both the Fiber Optics Installer Certification and the Technician Certification are valid for 4 years and cost \$155.00 each. All Aviation Certifications are \$180.00 each.

TO LEARN MORE ABOUT THE ETA

<http://www.eta-i.org>

CUSTOMIZE YOUR COURSE

TRAINING REQUIREMENTS

We will customize any of our training courses and tailor them to meet your training requirements. Call us to discuss your training requirements and to request a quote. Whether you require Blown Optical Fiber Training, termination instruction for LC or 3M Hot Melt connectors or training procedures for ribbon fiber or fan-out kits, we can accommodate your needs and customize your training.

ON-SITE TRAINING

With our established mobile training services, we have the ability to train at your location, **anywhere in the world!** Any of our fiber optic termination training courses can be taught at your facility to meet your requirements and schedule. We provide a full line of tool kits and test equipment for training, but if you require training on your equipment our instructors can train your technicians using your tools, kits and test equipment. We can tailor any of our training courses to meet your schedule and operational requirements, from 1 day to 1 week, 2 weeks, or longer. By sending our instructors to your location, you can eliminate travel expenses incurred by sending your employees to our facility for training. We can also train your technicians after your normal business hours. We are flexible to meet your training needs!

PRICE: QUOTES BY REQUEST

“We’re ready to roll at a moment’s notice.”

