

FOCIS Flex - No Wireless

Fiber Optic Connector Inspection System User Guide

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Safety Information

IMPORTANT! Proper care in handling should be taken when using any precision optical test equipment. Scratched or contaminated optical connectors can impact the performance of the instrument.

NOTE! FOCIS Flex contains no user serviceable parts. This instrument must be returned to AFL or authorized agents for repair.

IMPORTANT! It is important to keep connector end-faces on the launch and receive cables and those on the Fiber Under Test (FUT) clean, to ensure accurate measurements and operation.

CAUTION! Never view a live fiber. Never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords and jumpers. Laser radiation is harmful to eyes.

WARNING! Use only the specified AC adapter. Use of another type of AC adapter can damage the instrument and create the danger of fire and electrical shock.

WARNING! To avoid the danger of fire and electrical shock:

- Never use a voltage that is different from that for which the AC adapter is rated.
- Do not plug the unit into a power outlet that is shared by other devices.
- Never modify the power cord or excessively bend, twist, or pull it.
- Do not allow the power cord to become damaged. Do not place heavy objects on the power cord or expose it to heat.
- Never touch the AC adapter while your hands are wet.
- Should the power cord become seriously damaged (internal wiring exposed or shorted), contact the manufacturer to request servicing.

NOTE! Refer to your company's safety procedures when working with optical systems.

NOTE! Follow your company's approved cleaning procedures.

General Information

How to View Device Information Menu

- From the Live Image mode (A), press the Main Menu (B) key to access the Main Menu screen.
- Press Up/Down arrow keys to navigate and highlight the Device Info menu .
- Press Select p or Right rarrow key to display a subscreen of the Device Info menu, which will display the following Info:
 - Device name
 - Serial number
 - Controller version number
 - User Interface version Number
- Press Back soft key to return to Live Image mode.

Note: It is helpful to have your FOCIS Flex Device Information available if you need to contact AFL Test & Inspection Customer Service or Technical Support.





Warranty Terms and Conditions

AFL Test and Inspection products are warranted against defective material and workmanship for a period of (1) one year from the date of delivery to the end user. Optional Extended Warranty starts at the end of the standard (1) one year warranty period. Any product that is found defective within the warranty period, will (at the discretion of AFL) be repaired or replaced. Warranty will be voided if the product has been repaired or altered by other than an authorized AFL repair facility or when it has been subjected to misuse, negligence, or accident.

In no case shall AFL liabilities exceed the original purchase price.

Repair Services

Please contact customer service for a return authorization number prior to sending your AFL test equipment in for repair or calibration.

USA Repair and Calibration services

AFL Test & Inspection Division 16 Eastgate Park Road Belmont, NH 03220 603-528-7780 800-321-5298

Europe Repair and Calibration services

Fujikura Europe Ltd.
C51 Barwell Business Park
Leatherhead Road
Chessington, Surrey, KT9 2NY
+44 (0) 208 240 2020

Standards Compliance Information

FOCIS Flex has been designed and tested to comply with the relevant sections of any applicable specifications including full compliance with all essential requirements of the applicable EU Directives.







FOCIS Flex Overview

Controls, Display, Interfaces

Controls

- 1 Power key Φ
- 2 Image Capture key O
- 3 F1 soft key (typically Back function)
- 4 F2 soft key (typically Select function)
- (5) Navigation and Edit functional keys

Display (2-inch Color LCD [320 x 240])

- 6 Screen title
- 7 Battery status icon
- 8 Image and information display area
- 9 F1 and F2 soft key labels area

Interfaces

- 10. Optical inspection port
- 11. Adapter tip
- 12. Dust cover
- 13. Micro-USB port
- 14. 5 VDC input jack
- **15**. Charging indicator





FOCIS Flex Overview

Properly Installing and Removing Adapter Tips

FOCIS Flex is available with the following adapter tips:

Connector	UPC C	UPC Connectors		APC Connectors	
	Ferrule	Bulkhead	Ferrule	Bulkhead	
SC	FFLX-01-U25	FFLX-01-SC	FFLX-01-A25	FFLX-01-ASC	
FC	FFLX-01-U25	FFLX-01-FC	FFLX-01-A25	FFLX-01-AFC	
LC	FFLX-01-U125	FFLX-01-LC	FFLX-01-A125	FFLX-01-ALC	
ST	FFLX-01-U25	FFLX-01-ST	Not applicable	Not applicable	

Note: Contact AFL Sales Representative or Tech Support for additional connector adapter tips

Installing Adapter Tips

- While holding adapter tip in place, raise captive nut (A) until it engages with adapter tip threads.
- Turn captive nut counter-clockwise (viewed from front/top).
- Hand-tighten (do not over-tighten).

Removing Adapter Tips

Probe tips are held in place with a captive nut (A).

- Turn captive nut clockwise (viewed from front/top).
- Continue until captive nut is free of adapter tip.
- Remove adapter tip by pulling it gently straight off the probe base.

Note: For proper viewing, APC connectors must be aligned with the slot **B** in the threaded area of the correct APC adapter tip.



Identifying Connector Adapter Tips

- FOCIS Flex adapter tips are engraved to indicate connector type and application.
- FOCIS Flex adapter tips are shipped in labeled containers. Labels indicate:
 - AFL part number.
 - Connector type, ferrule type (UPC or APC), application.
- Blue ring on the adapter tip base indicates tip for UPC polished connector.
- Green ring on the adapter tip base indicates an adapter tip for anglepolished (APC) connector.

AFL NO.	Engraved ID	Description
FFLX-01-SC	SC	SC-UPC, Bulkhead
FFLX-01-FC	FC	FC-UPC, Bulkhead
FFLX-01-ST	ST	ST-UPC, Bulkhead
FFLX-01-LC	LC	LC-UPC, Bulkhead
FFLX-01-U25	U25	2.5 mm, UPC, Ferrule
FFLX-01-U125	U125	1.25 mm, UPC, Ferrule
FFLX-01-ASC	ASC	SC-APC, Bulkhead
FFLX-01-AFC	AFC	FC-APC, Bulkhead
FFLX-01-ALC	ALC	LC-APC, Bulkhead
FFLX-01-A25	A25	2.5 mm, APC, Ferrule
FFLX-01-A125	A125	1.25 mm, APC, Ferrule

Powering Up/Down

Power-Up

Press and release the Power key (A).

Power-Down

Press and hold the Power key

 until display turns off.

Configure FOCIS Flex to Auto-Off

- From the Main Menu -> Settings, select Display & Power Save option.
- Select desired power save option: 2 min, 5 min, 10 min, Never.



Battery Charging and Operation

- Plug the included AC Charger into AC outlet.
- Connect charger plug into 5 VDC jack **B** on FOCIS Flex.
- LED C indicates charging status as follows:
 - OFF AC not connected
 - RED Charging battery
 - GREEN Fully charged
 - RED/GREEN flashing Charging error. Verify correct
 5VDC 2A charger is used. Allow to cool before charging.
- FOCIS Flex charges while operating.
- Battery icon indicates battery state as follows:
- AC connected; charging, not fully charged
- AC connected; charging, fully charged
- Battery operation, fully charged
- Battery operation, partially charged
- <15 min Battery operating time remaining

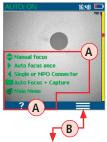




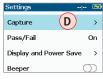
Live Image Mode Features

FOCIS Flex powers-up in the Live Image mode.

- Pressing and holding the Help ? soft key A displays help tips about FOCIS
 Flex keys usage. Note: pressing the Left ◀ arrow key toggles between
 connector types:
 - **Single** (single fiber connector, UPC or APC)
 - MPO-PC/APC (MPO/MTP® multi-fiber connector; PC or APC finish)
 - MPO-Flat (MPO/MTP multi-fiber connector; Flat finish [rare])
- Pressing the Menu
 = soft key
 B displays the Main Menu that allows the
 user to set preferences, perform general settings, manage saved test results
 and perform other non-test functions.
- Pressing Menu > Setting C > Capture D displays the Capture settings menu.
- When the Auto Focus option is enabled (E) in the Capture screen and Capture key (O) is pressed:
 - Auto focus is initiated
 - Image is captured when auto focus completes
 - Image is analyzed if Pass/Fail set to On
 - FOCIS Flex transitions to Captured Image mode
- When Auto Focus is enabled or disabled:
 - Press Right ▶ arrow key to auto focus once
 - Press Up/Down ▼▲ arrow keys to manually adjust focus
- When the Auto Focus option is disabled F in the Setting screen and Capture key is pressed:
 - Image is captured (without adjusting focus)
 - Image is analyzed if Pass/Fail set to On
 - FOCIS Flex transitions to Captured Image mode











Capture Key Operation

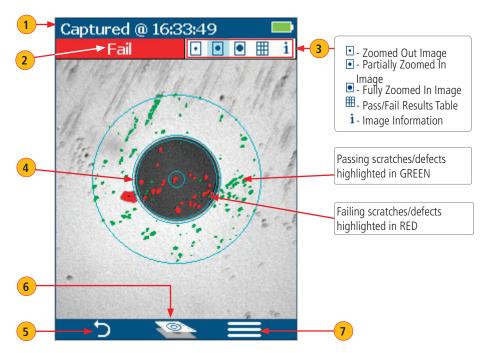
- In the Live Image mode, press the Capture key to perform the following:
 - Auto Focus image (if the Auto Focus option is enabled)
 - Capture the displayed image and enter the Captured Image mode
 - Analyze image (if the Pass/Fail option is enabled)
- In Captured Image mode, press the Capture key to return to Live Image mode.
- In the Main Menu or Settings modes, press the Capture key to return to the most recent Live or Captured Image mode.

Captured Image Mode Features

Once an end-face image has been captured and analyzed, a zoomed-out view of the end-face and results is displayed.

Description

- 1 Screen Title: displays File Name (e.g. COO1-003) if saved image is shown or Captured @ hh:mm:ss if unsaved image is shown.
- Pass/Fail Indication: shown only if Pass/Fail option is enabled in Settings.
- 3 Display Tabs: select the desired view using the Left/Right ◀▶ arrow keys.
- 4 End-face Image: displays end-face image with Pass/Fail overlay (if enabled).
- **5** Back soft key: press to return to previous screen.
- - End-face image with overlay layer shown (default view)
 - End-face image only
 - Overlay only

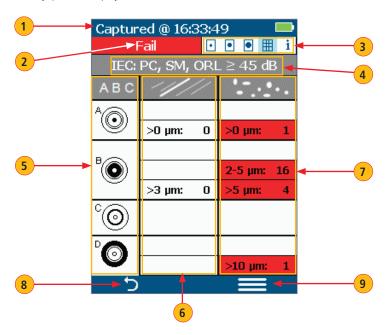


Zoomed in end-face image with Overlay

Pass/Fail Results Table

Description

- 1 Screen Title: displays File Name (e.g. COO1-003) if saved image is shown or Captured @ hh:mm:ss if unsaved image is shown.
- 2 Pass/Fail Indication: shown only if Pass/Fail option is enabled in Settings.
- 3 Display Tabs with the Pass/Fail display tab selected.
- 4 Analysis Rule applied to determine Pass/Fail.
- 5 Analysis Zones: A core, B cladding, C adhesive, D contact area.
- **6** Scratch analysis results for each zone:
 - Reports the number of detected scratches exceeding limit for each region
 - Highlights failed rules in RED
- 7 Defect analysis results for each zone:
 - Reports the number of detected defects exceeding limit for each region
 - Highlights failed rules in RED
- 8 Back soft key: press to return to previous screen.
- 9 Menu soft key: press to display the Save/Send Menu.

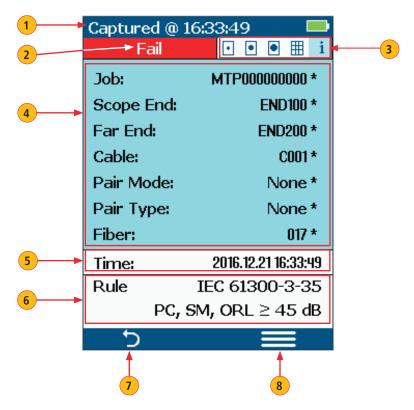


Note: See section <u>"Setting Pass/Fail Criteria" on page 14</u> for details on how to select and/or edit pass/fail analysis rules.

Image Information Screen

Description

- 1 Screen Title: displays File Name as follws,
 - <Cable>-<Fiber> (e.g. COO1-003) if saved image is shown.
 - 'Captured @ hh:mm:ss' if unsaved image is shown.
- Pass/Fail Indication: shown only if Pass/Fail option is enabled in Settings.
- 3 Display Tabs with the Image Information display tab selected.
- 4 Results ID field: indicates default folder/file names.
 - Blue highlighted indicates that results are not saved.
- 5 Time & Date field: indicates Time & Date of the displayed captured image.
- 6 Rule field: indicates pass/fail analysis rule applied.
- 7 Back soft key: press to return to previous screen.
- 8 Menu soft key: press to display the Save/Send Menu.



Note: See section <u>"Saving Captured Images" on page 18</u> for details on how to name and save results.

Main Menu Overview

Main Menu

The Main Menu is accessed from Live Image mode by pressing the Menu ≡ soft key. Main Menu is used to select user preferences, perform general settings, manage saved test results, and perform other non-test functions.

While in the Main Menu:

- Press Up/Down arrow keys to navigate and select (highlight) one of the menu item as follows.
 - Settings: Use to configure Auto Focus, Pass/Fail criteria, Bluetooth, and general settings
 - Results Manager: Use to navigate and review or send saved test results
 - Last Image: Use to recall most recently viewed image
 - Device Info: Use to view serial number, software revision, etc
- Press Select
 A or Right
 arrow key to display a sub-screen of the selected menu item
- Press Back (B) soft key to return to Live Image mode



Settings Menu Overview

While in the Settings Menu:

- Press Up/Down arrow keys to navigate and select (highlight) the desired menu item.
- For Beeper settings:
 - Pressing Select soft key toggles setting between enable/disable.
 - Pressing Right ▶ arrow key enables setting.
 - Pressing Left ◀ arrow key disables setting.
- For all other settings, press Select soft key or Right ► arrow key to display a sub-menu and edit the selected parameter.
- Press Back soft key to return to the previous menu screen.
- Press Capture Key to return to live image mode.

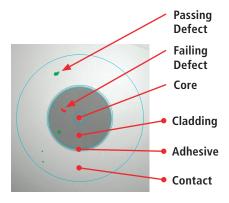


IEC Pass/Fail Analysis

IEC 61300-3-35 defines connector inspection pass/fail criteria.

Pass/Fail criteria depends on:

- Fiber type (SMF or MMF)
- Connector end face regions
 - A region: Core
 - B region: Cladding
 - C region: Adhesive (between cladding
 - and ferrule)
 - D region: Physical contact area
- Type of end face flaw:
 - Scratches
 - Defects (contamination, particles, chips)
- Size of flaw



Example IEC Rule

Shown below is the display when the IEC rule for single-mode PC connector with return loss \geq 45 dB is selected. The table identifies the number of scratches or defects of a certain size, which may be allowed in each of the core, cladding, and contact regions.

Region	Scratch	Defect	
	>0 µm: 0	>0 µm: 0	
A: Core	No scratches >0 μm	No defects >0 μm	
	allowed	allowed	
B: Cladding	>3 µm: 0	2-5 μm: 5	
	No scratches >3 μm	Up to 5 defects 2-5 µm	
	allowed	diameter allowed	
		>5 µm: 0	
		No defects >3 μm	
		allowed	
C: Adhesive	Blank	Blank	
	(No limitations on	(No limitations on	
	scratches)	scratches)	
D: Contact	Blank	0 ≥ 10 µm	
	No limitations on	No defects ≥ 10 µm	
	scratches	allowed	

IEC Ru	les		10:44	
Rule			61300-3	
	PC, S	и, О	RL ≥ 45	dВ
ABC	1//			٠.
4				
	>0 µm:	0	>0 µm:	0
B 💮				
			2-5 μm:	5
	>3 µm:	0	>5 µm:	0
\odot				
•				
			>10 µm:	0
5				

Setting Pass/Fail Criteria

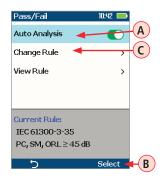
Pass/Fail menu is accessed from the Live Image mode > Main Menu > Settings.

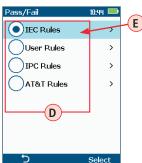
Enable/disable Auto Analysis

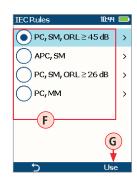
- Highlight Auto Analysis (A).
- Use Select key (B) to enable/disable (C)() Pass/Fail analysis.

Change Rule:

- Highlight Change Rule (C).
- Press Select or Right ▶ arrow key to display a list of the available Rules D.
- Press Select or Right ► arrow key to display a sub-list F.
- Use Up/Down \Rightarrow arrow keys to highlight the desired rule.
- Press Use **G** to apply the selected Rule in Pass/Fail analysis.

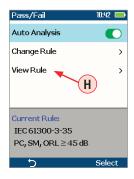


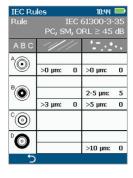




View Rule

- Highlight View Rule (H).
- Press Select or Right ▶ arrow key to view details for the current rule.
- User Rules may be edited while viewing.

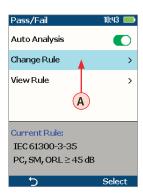




Setting Pass/Fail Criteria

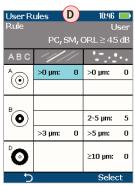
Edit User Rule:

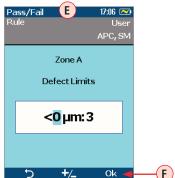
- Highlight the Change Rule option (A).
- Press Select or Right ▶ arrow key to display a list of Rules sub-screen (B).
- · Highlight the User Rules group.
- Press Select to display a list of User Rules (C).
- Use Up/Down \Rightarrow arrow keys to highlight the desired rule to edit.
- Press the Right ➤ arrow key to view details screen for currently selected rule.
- While in the Rule details screen D, use arrow keys to highlight the desired Region and Scratches/ Defects parameter.
- Press Select to display the Limits Editor screen (E).
- Use Left/Right ◀▶ arrow keys to select a digit.
- Press Ok (F) to confirm changes.











Configuring Auto-Save

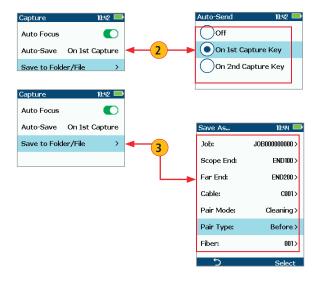
- 1 From the Main Menu, select Settings > Capture > Auto Focus
 - Use ◆▶ to enable or disable the auto-focus option



- 2 Highlight and Select Auto-Save. Use ▼▲ to disable auto-send, enable on 1st Capture key, or enable on 2nd Capture key.
- 3 Highlight and select Save to Folder/File. Use ▼▲ to select and edit the desired folder/file field.

When Auto-Save is enabled, press Capture from Live Image mode to auto-focus (if enabled), capture image, analyze pass/fail (if enabled), then send image and pass/fail results to paired device and save image and pass/fail results to configured Job/Cable folder.

Note: If Auto-Save on 2nd Capture key is enabled, you will be prompted to press the Capture key again to save or send. Press the Back key if you do not wish to save or send image.



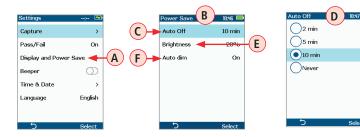
Power Save Setting

Select desired Power Save Setting

From the Main Menu > Settings, highlight and select the Power Save A option to display the Power Save settings menu B. From the displayed Power Save menu, you may perform the following settings:

- Highlight and select the Auto Off option C
 - From the displayed Auto Off sub-menu (D), highlight and select the desired time option.
- Highlight and select Brightness (E)
 - Use Up/Down → arrow keys to increase or decrease the brightness.
 - Note: dimmer display extends battery life
- Highlight and select the Auto dim option (F). From the displayed sub-menu (G):
 - Select Auto dim; use Left/Right ◀▶ arrow keys to enable/disable auto-dimming
 - Select Delay, use Up/Down

 arrow keys to increase / decrease auto dim time





Set Time and Date

- Highlight Time & Date (H).
- Use Select or Right ▶ arrow key to display the Time/Date setup menu ①.
- Use Left/Right ◀▶ arrow keys to select the desired time/date field to edit.
- Use Up/Down → arrow keys to change the selected value.
- Press OK to confirm time/date settings and return to the Settings screen.



Saving Captured Images

Saving to the Current Folder

- While in the Captured Image mode, press the Menu
 soft key to display the Save/Send screen.
- Highlight Save (A) and press Select soft key to save image and results to the current folder.



Saving to a Newly Created Folder

New Job, Cable End, Cable, or Fiber names are created by editing an existing file name.

To edit a file name

- While in the Save/Send screen, using Up/Down ▼▲ keys, navigate to the desired parameter: Job, Cable End, Cable, Pair Mode, Pair Type, or Fiber.
- Press Select or Right ➤ arrow key to display Editor B.
- Use ◀▶ ▼▲ arrow keys to edit text field C.
- Press Ok (D) soft key to save new name .



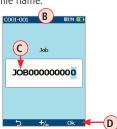
Saving to an Existing Folder

- Highlight the Existing folders (E) option.
- Press Select or Right ▶ arrow key to display a list of existing folders.
- Press Right ▶ arrow key to open selected Job folder.
 - Repeat for desired Cable folder and Fiber number as needed.
- Press Use soft key **(G)** to confirm selection.
- When back in the Save/Send screen, highlight Save (H) and press Select.









Configuring Image Pairing

Image Pairing functionality allows user to capture and save two images for each fiber.

Available Pairing Modes and Pairing Types

Pairing Mode	Pairing Type
None	None – Image pairing disabled
Cleaning	Before – image before connector cleaned After – image after connector cleaned
Input / Output	Input – network input connector image Output – network output connector image
Documenta- tion	As built – image of connector when network built As found – connector as found when troubleshooting
Mating	Jumper – image of patch cord connector Bulkhead – image of panel-mounted bulkhead connector

TRM 2.0 reporting software allows user to prepare reports containing paired images

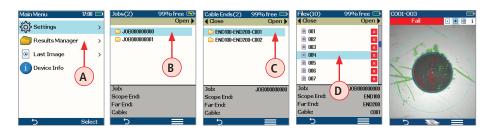


Viewing Saved Results (Results Manager)

Opening Image Files - Reviewing Saved Results

The Results Manager is accessed from the Live Image mode > Main Menu.

- - Press Select or Right ▶ arrow key to display a list of existing Job folders.
- Use Up/Down ♦ arrow keys to navigate and highlight the desired Job folder **B**.
 - Press Right ▶ arrow key to open the selected Job folder and display a list of existing Cables.
- - Press Right ▶ arrow key to open the selected Cable folder and display a list of existing files.
- - Press Right ▶ arrow key to open the selected image File.
- Press Back soft key or Capture key to return to Live Image mode.



Creating New Jobs/Cables/Files

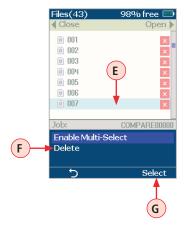
New Job, Cable End, Cable, or Fiber names are created in the Captured Image mode by editing an existing file name. For details see section titled <u>"Saving to a Newly Created Folder" on page 18.</u>

Deleting Jobs/Cables/Files

- Access the Results Manager.
- Use the Up/Down \$\display\$ keys to navigate and highlight the desired job/cable/file \$\begin{align*}
 \begin{align*}
 \begin{align
- Press the Menu ≡ soft key.
- Press the Up/Down

 keys to highlight Delete

 F.
- Then press Select G to delete the highlighted job/cable folder or results file.



Sharing Captured Test Results

Uploading Inspection Results to a PC

On FOCIS Flex

- Turn your FOCIS Flex unit off.
- Using the supplied USB cable, connect the micro-USB port on your FOCIS Flex unit with a USB port on your PC.
- Verify FOCIS Flex powers up and displays:
 - Mass Storage
 - Video
- Select the Mass Storage mode.

On PC

- · Select 'My Computer'.
- Verify that device labeled 'PROBE (E:\)' appears in My Computer window Note: drive letter assigned to PROBE device may be different.
- Double-click PROBE (E:\) to view contents of the FOCIS Flex internal memory.
- Double-click on RESULTS folder.
- Drag, copy, or move some or all of the results to your PC.
- When finished, disconnect USB cable and turn off FOCIS Flex (since FOCIS Flex will remain on and return to normal operation if USB cable simply disconnected.)

Inspection Reporting using TRM® 2.0

On PC

- Install and run TRM 2.0
- Select Report Wizard
- Navigate to uploaded FOCIS Flex Results.
- Select entire [Cable] for all results.
- Select individual fiber for single result.
- Select desired inspection template (2 or 12 results per page).
- Select Finish and print or save as PDF file.



Thank you for choosing AFL Test & Inspection!





