



FK12 FIBER CLEAVER USER'S GUIDE

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The Photon Kinetics Product Warranty is as follows:

- 1) Photon Kinetics warrants all of its Products to be free from defects in materials and workmanship for a period of thirteen (13) months from the date of shipment from our factory. This warranty applies to all Products including fiber cleavers and other fiber preparation tools, but does not include any parts or components which are consumed, worn or otherwise degraded during the course of the normal operation of the Product. These excluded parts and components include, but are not limited to, the following: halogen lamps, fiber holders, cleaver blades, input/output lenses, ribbon cables, printer consumables, cable assemblies and any custom (special) components.
 - a) Our Responsibility - Photon Kinetics' sole responsibility under this Warranty shall be to either repair or replace, at Photon Kinetics' option, any covered Product or component of the Product that fails during the Warranty period because of a defect in workmanship or materials. All replaced Products or Product components shall become Photon Kinetics' property. Replacement Products or Product components may be reconditioned parts that fully meet applicable specifications. The Warranty for these replacement parts is ninety (90) days or the remainder of the Warranty period, whichever is longer.
 - b) Products Covered - The Warranty covers Products as delivered by Photon Kinetics to the customer, in unmodified condition. The customer understands that modification of any Product without Photon Kinetics' prior written consent shall invalidate the Warranty.
 - c) Customer's Responsibility - The Warranty set forth above is contingent upon proper treatment and use of the Product and on maintenance of a safe and suitable site. The Warranty does not apply to repair or replacement if the Product has been subjected to misuse, unauthorized modification, improper or inadequate installation, maintenance, accident, unusual physical or electrical stress, or unauthorized integration with other products not covered by Photon Kinetics' Warranty. The Warranty also does not apply to repairs or other support resulting from any customer modification of Photon Kinetics source code.
 - d) Other Limitations - The Warranty set forth above shall not be affected because of any technical advice, assistance, or service furnished by Photon Kinetics in connection with the Products. No obligation or liability shall arise from such assistance. The customer is not relying on Photon Kinetics' skill or judgment to select or furnish suitable Products for customer's purpose.
- 2) Photon Kinetics' Warranty to the customer shall be the standard Warranty for the Product which is in effect on the date of shipment to the customer.
- 3) THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR OBLIGATIONS, EXPRESS OR IMPLIED. SELLER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PURPOSE. CUSTOMER AGREES THAT IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS OR LOSS OF USE OR ANY OTHER ECONOMIC LOSS, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY. THE REMEDIES PROVIDED HEREIN ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES.

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UNPACKING INSTRUCTIONS

The FK12 Ultrasonic Fiber Cleaver is shipped enclosed in foam molded material in a cardboard box. This packaging should be retained and used whenever the cleaver is shipped.

PACKAGING REMOVAL

The FK12 Ultrasonic Fiber Cleaver is shipped with an elastic band holding the blade mechanism in place. This should be carefully removed before using the cleaver. Save the band in the event that the cleaver needs to be shipped in the future. The blade and clamps should be cleaned with methanol or propanol before using the cleaver. Do not use aggressive solvents, such as acetone, for cleaning. The package also includes a screwdriver and socket wrench to be used when making adjustments.

BATTERY INSTALLATION

The FK12 Ultrasonic Fiber Cleaver requires a 9-volt battery to power the piezo-electric transducer. One is supplied with each unit.

OPERATING INSTRUCTIONS

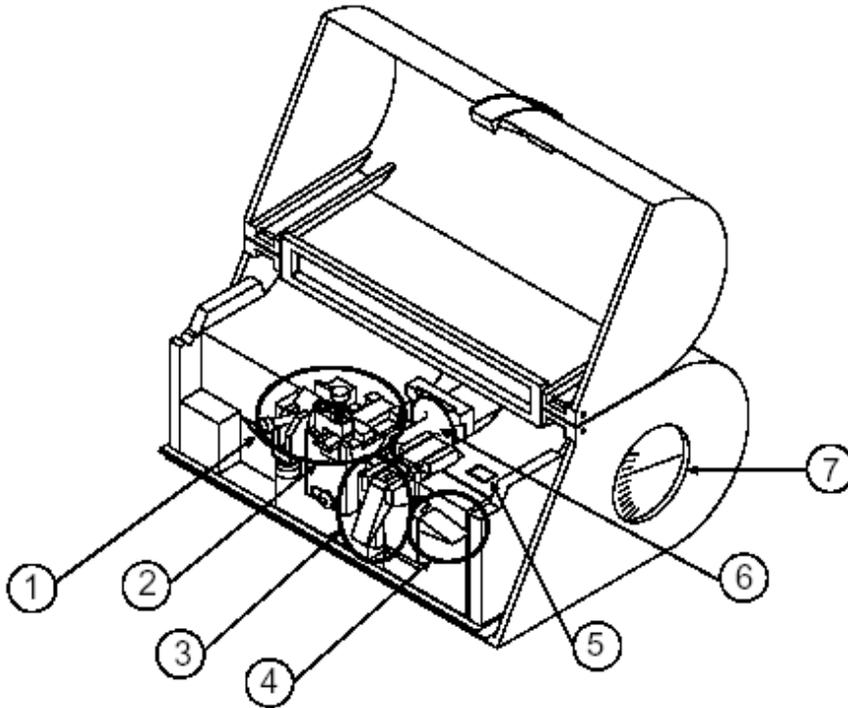


Figure 1: FK12 Ultrasonic Fiber Cleaver

1. Fiber Cleaving Lever (shown in detail in Figure 6)
2. Left Clamp and Lever Assembly (shown in detail in Figure 2)
3. Right Clamp and Lever Assembly (shown in detail in Figure 3)
4. Fiber Tension Lever (shown in detail in Figure 4)
5. Indicator LED
6. Diamond Blade Horn Assembly
7. Tension Gauge

Note: Set the Left Clamp Lever to the LOCK position (UP). ALWAYS leave this lever in the BLADE LOCKED position when the FK12 Ultrasonic Fiber Cleaver is not being used.

FACTORY SETTINGS

The FK12 Ultrasonic Fiber Cleaver has been preset at the factory to cleave 125 μm bare fiber at a nominal angle of 8 degrees unless requested otherwise.

If fibers of substantially different specifications are to be cleaved, the tension indicator setting must be changed (the procedure is described in ADJUSTMENTS on Page 5 of this manual). This may be done prior to delivery if a few meters of sample fiber are forwarded to Photon Kinetics.

ROUTINE FIBER CLEAVING

Note: Absolute cleanliness is vital to good cleaves. Failure to cleave can cause damage to the diamond blade.

1. Clean all pads and V-groove before use. Prepare each fiber by stripping all coating materials over a length of 4.5 to 5 cm, then cleaning the exposed fiber using a suitable solvent. A good “wetting” with the solvent also helps to reduce static on the fiber. Allow the fiber to dry fully before attempting to cleave the fiber.
2. Set the clamp and cleaving levers in the UP position. With the levers in the up positions, the clamps are open, the Left Clamp is untwisted and the blade is back in the START position. The Fiber Tension Lever (shown in Figure 4) is in the READY (off) position with the lever up.
3. Place the prepared fiber in the grooves.

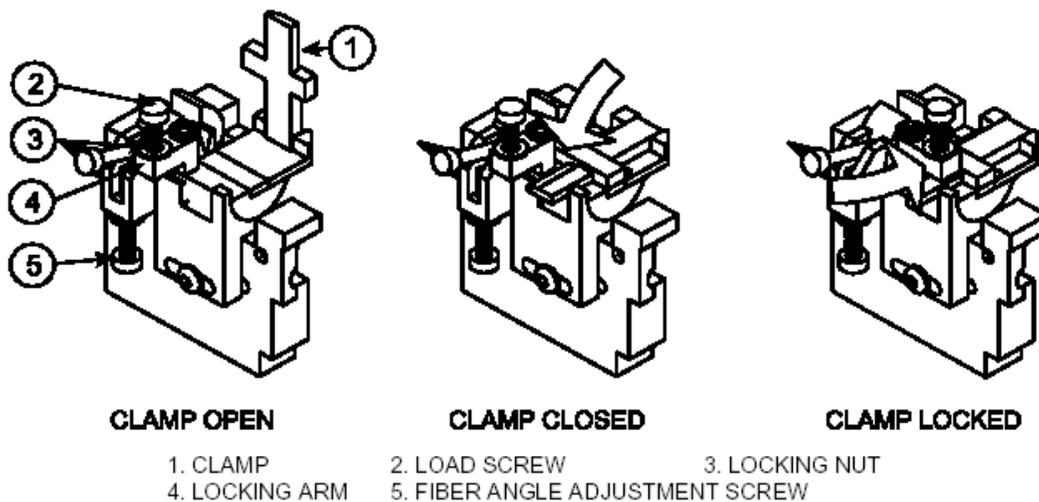


Figure 2: Left Clamp and Lever Assembly

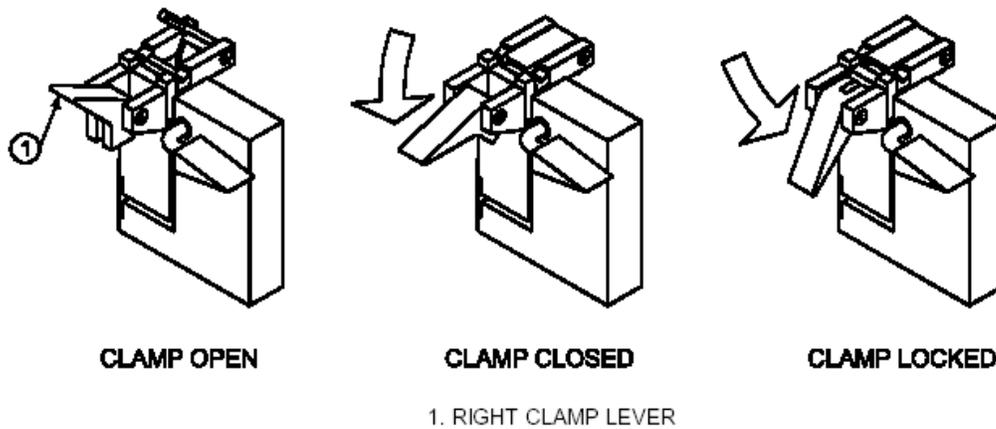


Figure 3: Right Clamp and Lever Assembly

4. Lower the Right Clamp Lever to the CLOSED position (see Figure 3). Lower the Left Clamp Lever (see Figure 2) with the fiber in the center of the clamp pad.

Note: When cleaving 900 μ m buffered fiber, the curl of the buffer coating can make it difficult to place the fiber in the grooves. In this case, after stripping and cleaning the fiber, place the stripped end of the fiber in the Right Clamp and lower the Right Clamp Lever to the CLOSED position, without locking the clamp, trapping the free end of the fiber. Next, rotate the fiber so that any fiber curl bends the buffered fiber in the vertical plane above the Left Clamp. This will allow the Left Clamp to be closed, trapping the buffered fiber in the 1 mm wide channels in the top and bottom faces of the Left Clamp.

The cleave length (distance between the end of the stripped buffer and the point of the cleave) can be set by locating the end of the stripped buffer against the millimeter scale on the top of the lower Left Clamp. The minimum cleave length which can be achieved is 6 mm. There is no maximum.

5. Rotate the locking arm fully anti-clockwise and turn the locking screw one-quarter turn past the first resistance, thus clamping the fiber. The Right Clamp should now be pressed fully down to the LOCKED position, clamping the free end of the fiber.

6. Move the Tension Lever smoothly downwards to the TENSION ON position (see Figure 4).

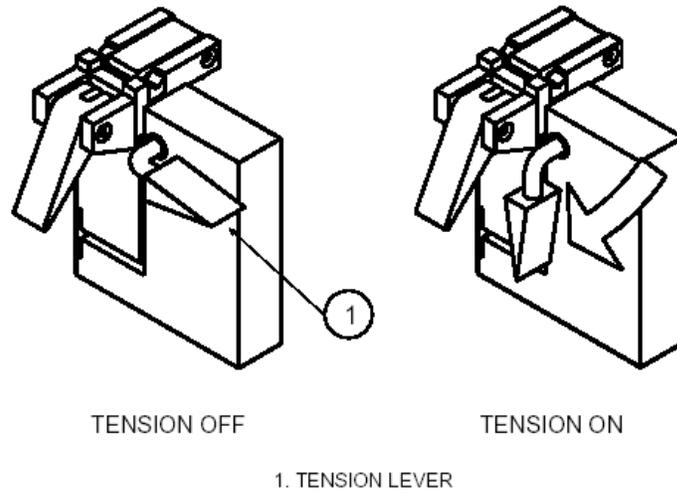


Figure 4: Fiber Tension Lever

7. Depress the Torsion Lever as far as the end-stop (see Figure 5). The end-stop should be previously set, using the Torsion Adjust Screw, to achieve the desired end angle on the fiber. This will apply a twist to the fiber while it is under tension.

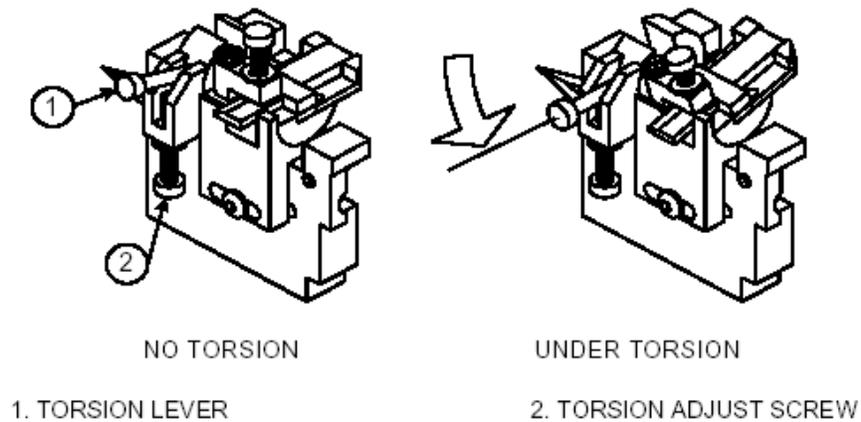


Figure 5: Torsion Lever on Left Clamp

8. In order to cleave the fiber, move the Fiber Cleaving Lever (shown in Figure 6) down smoothly to release the blade mechanism. The green LED will glow for approximately 3 seconds (this is to indicate that the blade is oscillating and the battery is in good condition). The blade will advance and cleave the fiber, producing an angled cleaved end.

9. After the fiber has been cleaved, raise the Fiber Cleaving Lever to the fully up position (shown in Figure 6), raise the Torsion Lever (shown in Figure 5) to the ZERO position then open the Left Clamp and remove the cleaved fiber. Return all levers to the START position (UP), ready for the next cleave. Remove the off-cut and dispose of it safely. The cleaver is now ready to cleave a new fiber.

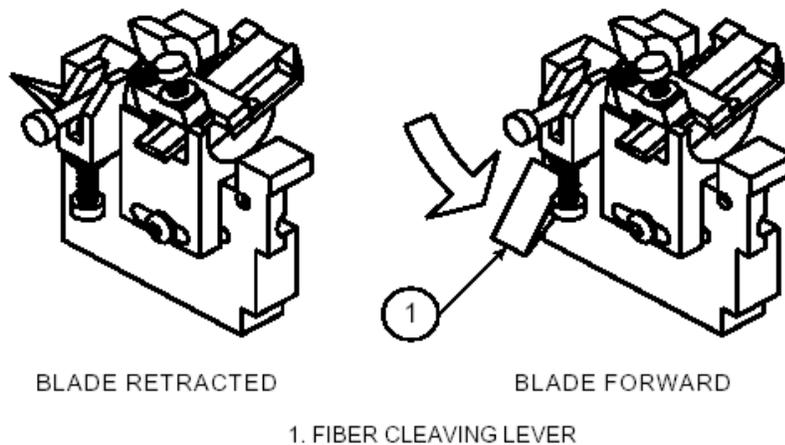


Figure 6: Fiber Cleaving Lever

ADJUSTMENTS

TENSIONER

The tensioner is used to apply tension to the fiber before it is cleaved. Normal setting of this tensioner is 200 on the gauge for 125 μm fibers.

To change the tension setting, raise the Right Tension Lever to the TENSION OFF position (up) and using a 2 mm screwdriver, turn the adjuster screw (accessible through the hole in the BOTTOM of the case) clockwise to increase the tension, or vice-versa.

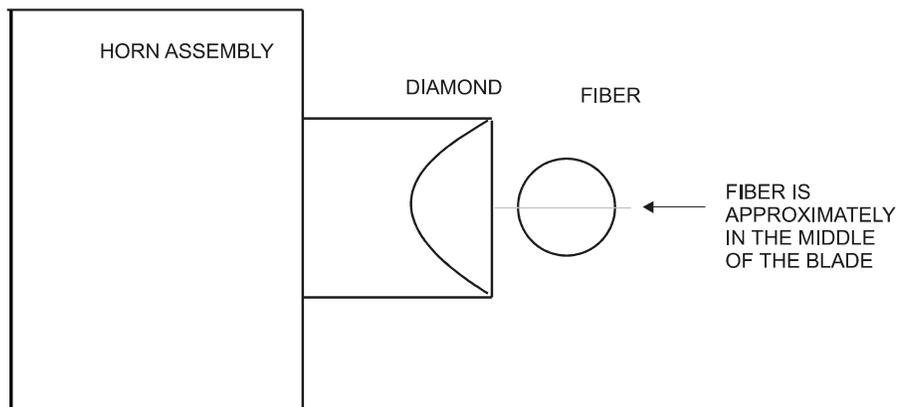
Note: *If the correct tension is not known, it is best to start with a high tension to ensure that the fiber is cleaved and then gradually reduce tension until a satisfactory cleave is obtained. This will avoid damaging the diamond blade by failure to cleave.*

BLADE ADJUSTMENT

The diamond blade may become worn after many cleaves, in which case, it should be raised to a new position.

To raise the blade, use a 2mm hexagonal wrench to turn the adjuster screw (accessible through the hole in the REAR of the case marked Blade Adj) clockwise a quarter of a turn.

Note: *The blade cannot be lowered.*



ADJUSTING ANGLE OF TWIST

The Torsion Lever (see number 1 in Figure 5) is depressed as far as the adjustable end stop in order to apply a twist to the tensioned fiber. To adjust the angle of twist, the Torsion Adjust Screw (see number 2 in Figure 5) can be rotated to adjust the position of the end stop.

Note: Angle of Twist does NOT equal the Fiber End Angle. See FIBER END ANGLE.

CLEAVE LENGTH

The cleave length can be adjusted by adjusting the position of the stripped buffer before cleaving. Locate the end of the stripped buffer against the millimeter scale marked on the top of the lower half of the Left Clamp. The minimum cleave length is 6 mm. There is no maximum length.

FIBER END ANGLE

The fiber end-angle obtained depends both upon the degree of twist of the fiber and the tension applied to the fiber. Increasing the angle of twist applied to the fiber, for a given tension, will increase the fiber end-angle. As the twist angle increases, the tolerances involved in the calibration of the tension and the twist gauges give rise to an increased uncertainty of end angle. However, once the correct amount of twist to achieve a certain end angle has been established, each cleaver will give consistent end angle values within the specification of ± 1 degree.

INTER-CLEAVER CONSISTENCY

Different cleavers are very consistent in the end angles they produce. For a given angle of twist, there is less than five percent variation in end angle using different cleavers.

TROUBLESHOOTING AND CLEANING OF COMPONENTS

Cleaving problems may be caused by any of the following:

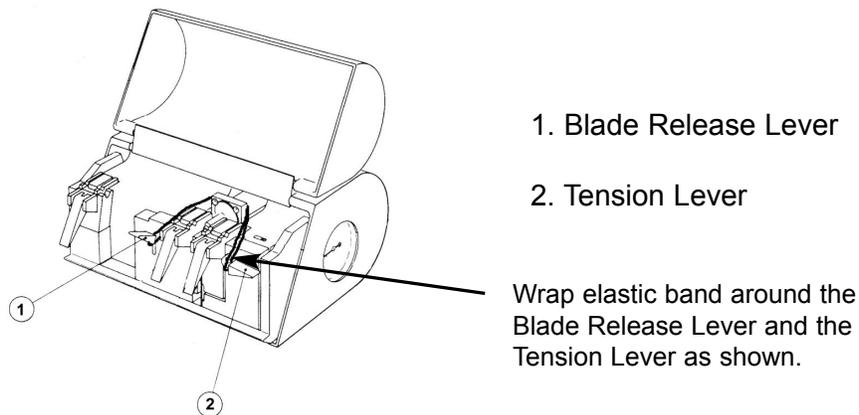
Note: Failure to cleave can cause blade damage.

Note: Do not use adhesive tape or other methods to coat the clamp surfaces. Contact Photon Kinetics if you have problems with clamp surfaces.

Problem	Solution(s)
Failure to cleave. Fiber bends instead.	<ol style="list-style-type: none"> 1. Clean fiber using isopropyl alcohol. 2. Increase tension on the fiber by following the instructions described in ADJUSTMENTS on Page 5. 3. Make sure the battery is working properly. 4. Clean all clamp faces with isopropyl alcohol, methanol, or propanol using a cotton-tipped stick and air duster. Dirty clamps are indicated by bad end angles or the fiber breaking under the clamp face. 5. Clean the diamond blade by thoroughly wetting it with methanol or propanol (do not use acetone) using a cotton-tipped stick. While it is still wet, lower the Fiber Cleaving Lever (see Figure 6). 6. Raise the blade one quarter turn.
Blade is not oscillating.	<ol style="list-style-type: none"> 1. Replace the battery. 2. Check for bad electrical connections. 3. Loose diamond blade needs to be replaced (return to Photon Kinetics for servicing).
Damage to the fiber end where the blade was in contact. Failure to cleave.	<ol style="list-style-type: none"> 1. Tension may be too low. Increase it to 200 grams. 2. Blade may be damaged and need replacing.
Hackle on the cleaved face.	Reduce tension on the blade by following the instructions described in ADJUSTMENTS on Page 5.
Wrong end angle	Adjust Fiber Angle Adjustment screw shown in Figure 2.
Slipping clamp	Clean clamp faces or fiber and check clamp tension.

RETURNING EQUIPMENT FOR SERVICING AND REPAIRS

If you need to return your FK12 Ultrasonic Fiber Cleaver for service, return the unit in its original shipping carton. Replace the elastic band to hold the cleaver blade in place during transit. See figure below for detail. Inadequate packaging can lead to serious damage and may invalidate any warranty. If you do not have the original elastic band, please use a size 19, 3 1/2 x 1/16" band as a replacement.



Before returning the cleaver, you must obtain a Return Materials Authorization (RMA) number. To obtain an RMA number, please have your model number and serial number available, and call +1 503 526 4678 or send an email to support@pkinetics.com. All cleavers should be returned to the following address:

Photon Kinetics, Inc.

Attn: RMA # [enter your RMA # here]
9305 SW Gemini Drive
Beaverton, OR 97008

Please include the following with your shipment:

- Return Materials Authorization (RMA) number.
- Model number and serial number.
- Your name, address, phone number, fax number and email address.
- Address to which the cleaver should be returned.
- Details of the problem.
- A purchase order for repair charges (not necessary for warranty repairs).
- Shipping instructions for return of the cleaver. If no shipping instructions are received, shipping arrangements will be made by Photon Kinetics and charged to the customer.

Photon Kinetics, Inc.
9305 SW Gemini Drive
Beaverton, OR 97008
USA



EC Declaration of Conformity

We,
Photon Kinetics, Inc.
9305 SW Gemini Drive
Beaverton, Oregon 97008-7160
USA

declare under our sole responsibility that the

FK11 Fiber Cleaver and its Variants

to which this declaration relates is in conformity with the following standards or other normative document(s):

Following the provisions of Directive 89/336/EEC for Electromagnetic Compatibility:

IEC 61326-1:	1997 Emissions
IEC 61326-1:	1997 Immunity
EN 61000-3-2:	Current Harmonics Test
EN 61000-3-3:	Voltage Fluctuation and Flicker Test

Due to the nature of the equipment and the low power operation, it is deemed unnecessary to apply testing to verify compliance. Product variants include, but are not limited to, the following models:- FK11, FK11-1, FK11-2, FK11-4, FK11-6, FK11-LDF, FK11-C, FK11-6C, EFC11, EFC11-4, EFC11-PM, FK12, FK11-PK-C, EFC11-S33, 1100-YCL (previously known as the FK11-SFA) and 2xxx-YCL (previously known as the FK11-PK).

Beaverton, Oregon, USA

06 May 2005
Date

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Rev. H

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Beaverton, OR 97008
USA



RoHS Certificate of Compliance

EC directive 2002/95/EC restricting the use of certain hazardous substances (the RoHS Directive) restricts the use of the following hazardous substances in electrical and electronic equipment: Cadmium, Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls, Polybrominated Diphenyl Ethers.

Based on information provided by our suppliers Photon Kinetics designates the product listed below as **RoHS compliant** when manufactured after the date specified on this certificate.

RoHS compliant means that:

- Our suppliers have confirmed the compliance status of the components and materials incorporated into this product.
- We have built the product in isolation from non-compliant products.
- We have introduced new part numbers for all compliant components and materials to identify and segregate compliant components and materials from non-compliant components and materials.

Confirmation of the compliance status of components and materials by our suppliers is either because the products do not contain any of the restricted substances referred to in Article 4(1) of the RoHS Directive at concentrations in excess of those permitted under the RoHS Directive, or because removal of the restricted substances is not technically possible and their existence in the products at levels in excess of these concentrations is allowed as one of the particular applications listed in the Annex to the RoHS Directive, or because they have been granted exemption under one of the amendments to the RoHS Directive, or because the products fall outside of the scope of the RoHS Directive.

For these purposes, the maximum concentration values of the restricted substances, by weight, in homogenous materials are:

Cadmium	0.01%
Lead	0.1%
Mercury	0.1%
Hexavalent Chromium	0.1%
Polybrominated Biphenyls (PBB's)	0.1%
Polybrominated Diphenyl Ethers (PBDE's)	0.1%

The product(s) covered by this RoHS Certificate of Compliance are as follows:-

Description: FK11/FK12-Series Optical Fiber Cleavers and their variants, replacement parts, spares and consumables.

Photon Kinetics Part Number(s): Part numbers xx-xxxx-xxG ("G" suffix denotes RoHS compliance).

Date of Compliance: Products manufactured January 2011 and thereafter. Note all products with part numbers ending with a "G" suffix manufactured prior to January 2011 are also compliant.

Beaverton, Oregon, USA

28 January 2011


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97-1349-00 Rev. A

Note: Not all FK Series Cleavers are RoHS compliant. Only those cleavers that are explicitly quoted and purchased as being RoHS compliant will meet the specifications in the certificate above.