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Corning Cable Systems SRP-001-055 Issue 11 April 2003 Page 1 of 6

# Operating the FBC-005 High Precision Cleaver

1.	General	1
2.	Precautions	1
3.	Cleaver Description	2
4.	FBC-005 Operation	2
5.	Maintenance	3
	Cleaning	3
	Lubricating the FBC-005	3
	Blade Adjustment and Replacement	4
	Vertical Spring Replacement	5
6.	Troubleshooting	6

### 1. General

1.1 The Corning Cable Systems FBC-005 high precision fiber cleaver mechanically produces right-angle end-cuts in single-mode and multimode silica glass fibers with an outside diameter of 100-140  $\mu$ m.

**1.2** The FBC-005 operates on a bend-and-scribe principle. The fiber is bent over an anvil by two pairs of clamps, tightened until it is taut, and scribed by a diamond blade. The tightening and scribing actions cause the fiber to break, resulting in a precise right-angle cleave (Figure 2).



Figure 2

**1.3** This issue includes an updated title.



# 2 Precautions

# 2.1 General Precautions

Safety Glasses

**WARNING:** The wearing of safety glasses to protect the eyes from accidental injury is strongly recommended when handling chemicals and cleaving fiber.

# 2.2 Chemical Precautions

# lsopropyl Alcohol

**DANGER:** Flammable. Flashpoint below 73° F. Keep away from heat, sparks and open flame. Can cause irritation to eyes on contact. In case of eye contact, flush eyes with water for at least 15 minutes. Inhaling fumes may induce mild narcosis. In case of ingestion, consult a physician.

# 2.3 Fiber Precautions

**DANGER:** Cleaved glass fibers are very sharp and can pierce the skin easily. Do not let cut pieces of fiber stick to your clothing or drop in the work area where they can cause injury later. Use tweezers to pick up cut or broken pieces of the glass fibers and place them on a loop of tape kept for that purpose alone. Good housekeeping is very important.

# 3. Cleaver Description

3.1 Figure 3 identifies the parts of the FBC-005 cleaver:



### Figure 3

\* Current production FBC-005 cleavers are equipped with clamping pads which permit cleaving most fibers on the market today. Cleave length is variable from 1 mm to infinity.

**3.2** The following tools and materials are provided with the FBC-005 cleaver:

- Case
- Cleaning strips
- Blade replacement tool
- Slotted screwdriver
- Lubricating oil
- Operator manual (SRP-001-055)

**3.3** The following items - which are not supplied - are required in order to complete the operating and maintenance procedures described in this manual:

- Lint-free tissues
- Swabs
- Tweezers
- Vinyl tape
- Isopropyl alcohol
- Vertical spring (p/n 280308-01)
- Hook-type spring tool (FBC-005-07) or kit with 10 vertical springs and spring tool (FBC-005-09)
- Small punch or dowel (maximum outside diameter of 2.8 mm [0.11 in.]
- 3 µm lapping film

### 4. FBC-005 Operation

**4.1** Make a loop of vinyl tape on which to place cut pieces of fiber. Place the loop in a convenient location.

**4.2** Prepare the fiber optic cable as described in its manufacturer's documentation.

**4.3** Strip at least 5 cm (2 in) of coating from the fiber according to its manufacturer's instructions.

**4.4** After the coating has been stripped off, clean the uncoated fiber by wiping with a lint-free tissue soaked in alcohol. Do not touch the cleaned fiber with your fingers.

IMPORTANT: Do not clean the fiber again after it has been cleaved. Alcobol on the fiber ends will result in high splice losses and quicken the deterioration of fusion splicer electrodes.

**4.5** Select the appropriate left fiber guide by pulling back on the guide lock and rotating the reversible guide (Figure 4).



Figure 4

**4.6** Pull the left fiber guide forward to its loading position (Figure 5a).

Place the fiber in the guide to give the required cleave length. Hold the fiber in the groove of the left fiber guide with your index finger. Slide the guide back to its operating position (Figure 5b).The stripped fiber should extend across the anvil to the other set of clamping pads and the right fiber guide.





**4.7** Holding the cleaver as shown in Figure 6, push down on the cleaver cover with a *slow and gentle* motion until the fiber is cleaved.





**4.8** Remove the cut end of the fiber with tweezers and put it on the loop of tape.

**4.9** After completing use of the cleaver, properly dispose of the tape loop holding the cut fiber ends.

# 5. Cleaver Maintenance

**IMPORTANT:** Most cleaver problems can be prevented through proper cleaning on a regular basis. Debris in the mechanism will result in poor performance.

# **Cleaver Cleaning**

**5.1** After each day's use, clean the guides, clamping pads, cutting blade, and anvil of the FBC-005 cleaver as follows:

(a) Clean the clamping pads by inserting a cleaning strip soaked in alcohol between the pads and pressing down on the cleaver to close them. Pull the strip from between the pads (Figure 7). Repeat this step several times.

Repeat this step several times with a clean, dry strip. Complete the cleaning by blowing the pads with compressed air.



Cleaning of the anvil and clamping pads may be followed by polishing. Polishing these components is recommended if a number of fibers have broken between the clamps.

Repeat the cleaning steps above, substituting a dry (no alcohol) 3 mm or finer lapping film, to polish both the upper and lower fiber clamps and the anvil. Then repeat with a dry paper strip to remove any residue.Polishing may performed on a weekly or as-needed basis.

(b) To clean the diamond cutting blade, insert a cleaning strip soaked in alcohol between the anvil and the cutting blade. Lift the cleaning strip up to the blade and brush along and down the blade at an angle.

Complete the cleaning by blowing the blade with compressed air.

(c) Carefully inspect the cleaver for any fiber remnants, bits of dirt, etc. Repeat steps a and b if necessary.

### Lubricating the FBC-005

**5.2** The FBC-005 should be lubricated every three months and before extended periods of storage. Lubrication on a regular basis will help assure you high quality fiber end-cuts with each use of the cleaver. The cleaver may be used during the lubrication procedure.

**CAUTION:** Do not apply oil or grease anywhere other than the pivot pin. Lubricants attract dust and dirt which may adversely affect the performance of your precisely machined fiber cleaver.

**5.3** Place one drop of synthetic oil (P/N FBC-005-02) on each side of the pivot pin (Figure 8).



### Figure 8

**5.4** Press the cleaver cover down about ten (10) times, and place another drop of oil on both sides of the pivot pin.

5.5 Wipe off all excess oil from the outer body of the cleaver.



### **Blade Adjustment and Replacement**

**5.6** If your cleaver stops making acceptable cuts, try increasing the fiber tension by using the switch on the back of the cleaver. The switch rotates in a clockwise direction from "Standard" (5 oz) to "+ 0.4 N" (6.4 oz.) (Figure 9).



**CAUTION:** Use a properly sized screwdriver to adjust the switch. Over- or under-sizing the tool may result in the destruction of the switch.

Use a step-up, trial and error procedure when increasing the fiber tension. For example, use the small slotted screwdriver to turn the switch form its "Standard" 9 o'clock position until its mark is at a 10 o'clock position. Use the cleaver and make a splice. If no improvement is noted, turn the switch to the 11 o'clock position, make a splice etc., until optimum setting is found.

**5.7** Corning Cable Systems recommends factory service for blade replacement and adjustment. The following procedure is provided should it be necessary to replace the cutting blade in the field.

**5.8** Remove the slotted screwdriver and blade replacement tool from the cleaver case. Use a cotton-tipped swab to position the blade arm as shown in Figure 10. Position the tool on the blade.



Figure 10

**5.9** Release the cutting blade retaining screw with the slotted screwdriver and withdraw the blade from the cleaver. *Take care not to misplace the screw*.

5.10 Place the new cutting blade into the tool (Figure 11).





**5.11** Insert the retaining screw into the hole of the replacement blade.

**5.12** Position the replacement blade in the cleaver, lining up the screw with the threaded hole. During positioning, use the tool to press the replacement blade upwards and back against the stop pin (Figure 12 inset).

**5.13** Tighten the retaining screw with the slotted screwdriver (Figure 12). Remove the swab from the blade arm.



Figure 12

**5.14** Make trial cuts after replacing the blade to make sure the cleaver is working properly. If the blade pushes the fiber out of position, the front edge of the blade is positioned too low. Loosen the screw and repeat steps 5.12 and 5.13.

### Vertical Spring Replacement

**5.15** If the cleaver's vertical spring is worn, broken, or disfigured, use the following steps to replace the spring.

**5.16** Remove the cleaver back plate by removing the single slotted screw (see Figure 13)

**5.17** Remove the cleaver cover by removing the two slotted screws. Lift the cover straight off the cleaver, taking care not to bend the small post which projects from inside the cover (Figure 13).





**CAUTION:** Do **NOT** remove the horizontal tension adjustment spring, nut or screw \* (Figure 14). These components require factory adjustment.

**5.18** Remove the parts of the broken vertical spring (Figure 14). If the spring is merely worn or disfigured and still attached to the horizontal posts, use a hook spring tool to unhook the spring from the top horizontal post.



**5.19** If necessary (typically on units with serial numbers

< 1000), insert a small punch or dowel into one of the lower horizontal post access holes of the cleaver.

Gently tap on the post until there is just enough space to remove the lower end of the new spring on the post

(Figure 15). If still present, slide the bottom end of the old spring off the post. *The lower posts on newer FBC-005s do not extend across the access space and therefore do not require the use of a dowel or punch to move them.* 



#### Figure 15

**5.20** Lower the new spring from above and behind the horizontal spring and secure it to the lower post.

Insert the dowel in the opposite post access hole and gently tap it back into place. Center the end of the spring on the lower post.

**5.21** Use the hook spring tool to lift and set the top of the new spring into the groove in the upper horizontal post (Figure 16).



**5.22** Reinstall the cleaver cover on the unit, carefully aligning both of the screw holes and the post inside the cover with proper holes in cleaver assembly. Secure the cover with the two slotted screws removed in step 5.17.

**5.23** Replace the back plate on the cover and secure with the remaining slotted screw. When properly installed, there is no friction in the normal movement of the cleaver.

# 6. Troubleshooting

**6.1** If your cleaver begins to perform inconsistently, or fails to make acceptable cuts, you may be able to easily correct the problem without returning your cleaver for factory servicing by following the instructions in Table 1.

Problem	Corrective action
Poor cleave quality	Check tension switch, clean per step 5.1
Fiber breaks under clamps	Clean cleaver clamps per step 5.1 a
Cleaver blade misses	Remove and reinstall blade
fiber	per steps 5.8 - 5.14
Cleaver blade pushes fiber	Remove and reinstall blade
out of place	per steps 5.8 - 5.14
Spring action of cleaver cover	Replace vertical spring per
weak or missing	steps 5.17 - 5.23

#### Table 1

**6.2** If the cleaver still does not work properly, and you wish to: return the cleaver for service, contact your Corning Cable Systems Customer Service Representative at (800) 743-2671.

Special Note: Fiber Optic Training Programs



Corning Cable Systems offers comprehensive, integrated training programs. Courses are structured for: Telephony, CATV, LAN, Intelligent Transportation Systems and Power Utilities.

For information on Engineering Services Training call: 800-743-2671.

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Corning Cable Systems LLC PO Box 489 Hickory, NC 28603-0489 USA For US and Canada 1-800-743-2673 International 828-901-5000 FAX: 828-901-5973 http:www.corning.com/cablesystems