

**LDCCM - September 23, 2020**

Item # LDCCM was discontinued on September 23, 2020. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

**VYTRAN® FIBER CLEAVERS FOR Ø80 µM TO Ø1.25 MM CLADDING FIBERS**

- ▶ Cleave Glass Fibers with Cladding Diameters from 80 µm to 1.25 mm
- ▶ Accepts SM, PM, MM, Capillary Tubes, PCF, Non-Circular Fiber, and Other Specialty Fibers
- ▶ Programmable Cleave Parameters via Included Tablet

**LDC401A**

Fiber Cleaver with Rotation Module for Angled Cleaves

Top and Bottom Fiber Holder Inserts (Must be Purchased Separately)



Included Tablet Controller Provides Easy-to-Use Interface for Operation



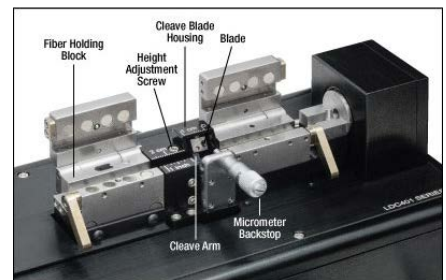
**OVERVIEW**

**Features**

- Cleave Glass Fibers with Claddings from Ø80 µm to Ø1.25 mm
- Flat Cleaves or Angled Cleaves up to 15°
- Programmable Processes for a Wide Variety of Fibers:
  - Single Mode, Multimode, and Polarization-Maintaining Fibers
  - Capillary Tubes\*
  - Photonic Crystal Fiber (PCF)\*
  - Microstructured Fibers\*
  - Non-Circular Fibers
- Touchscreen Tablet for Setting Cleave Parameters (See *Controllers* Tab for Details)
- Alternative Controller and Replacement Components Sold Separately Below
- Holding Blocks and Inserts are Compatible with Other Vytran® Systems:
  - FPS300 Cleaning and Stripping Station
  - LFS4100 Splicer
  - GPX3400 and GPX3600 Glass Fiber Processing Stations
  - GPX4000LZ CO<sub>2</sub> Laser Glass Processor



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 The LDCCM Kit (sold separately below) includes a digital microscope for imaging the fiber, cleave blade, and micrometer position. It also includes a mount with an integrated USB hub that allows the microscope to be controlled with the tablet included with each cleaver.



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 A close-up of the cleave assembly on the LDC401A. A clamping screw on the top of each holding block can be tightened to provide extra clamping force for gripping fibers with outer diameters ≥500 µm. Magnets in each holding block provide sufficient force for clamping smaller fiber diameters.

## Build Your System

- Large-Diameter Fiber Cleaver for Fibers with Claddings from Ø80 µm to Ø1.25 mm
- Choose Top and Bottom Inserts (Two Top Inserts and Two Bottom Inserts are Required; See *Fiber Holder Inserts* Tab for More Information)

These Vytran Fiber Cleavers precisely cleave fibers with claddings from 80 µm to 1.25 mm in diameter. The LDC401 is designed to produce flat cleaves perpendicular to the length of the fiber, while the LDC401A has a rotation stage module for creating angled cleaves up to 15°.\*

The cleavers use the "tension-and-scribe" cleaving process, where tension is applied along the length of the fiber followed by an automatic scribing process utilizing a diamond cleave blade. After the blade scribes the fiber, tension is maintained, causing the scribe to propagate across the fiber width and complete the cleave. The LDC401A accomplishes angled cleaves by using the rotation stage to apply torsion to the fiber prior to scribing; the cleave plane will be perpendicular to the maximum resultant stress created by the combined tension and torsion applied to the fiber.

The cleavers have settings to carry out an automated "sub-critical" scribe process designed to improve the cleave quality in specialty fibers, such as photonic crystal fiber (PCF), microstructured fibers, capillary tubes, or highly stressed fibers (multimode or polarization maintaining). Each cleaver is equipped with a flat-tipped micrometer backstop, which can help improve end-face quality when performing low-tension cleaves. See the *Cleaving Guide* tab for details.

The cleavers use a diamond blade for scribing the fiber. When used with proper cleave parameters, a single location on the blade can provide up to 5,000 cleaves (dependent on the cladding properties of the fiber being cleaved). The cleaver is designed so that the cleave blade can be repositioned approximately nine times before replacement (assuming proper cleave parameters and usage that does not cause unexpected damage to the blade). We only recommend using these cleavers with fibers that have a glass cladding; other materials, such as plastic, will rapidly degrade or damage the blade. Replacement blades are available separately below.

### Accessories

The LDC401 and LDC401A are designed to accept Fiber Holder Inserts that can clamp a variety of outer diameters. Our selection of top and bottom inserts are available separately below, listed with the maximum fiber sizes accepted by each insert. The *Fiber Holder Inserts* tab has a selection guide to aid in choosing which pairs of fiber holder inserts are required based on the diameter of the fiber to be leaved. Two top and two bottom inserts are required to operate the fiber cleaver.

As an alternative to the tablet controller included with each cleaver, we offer the VYT300C handset controller. This controller is compatible with Vytran large-diameter fiber cleavers as well as Vytran fiber recoaters with manual mold assemblies. One handset controller can be used to configure parameters on multiple fiber processing units in succession.

We also offer kits for adding a microscope to the cleaver, as well as mounting the tablet controller behind and above the cleaver. The digital microscope shows the fiber, cleave blade, and micrometer backstop at 20X or 220X zoom, enabling more effective use of the cleaver.

In addition to the large-diameter fiber cleavers, we offer the FPS300 Stripping and Cleaning Station, the LFS4100 Fiber Splicer, GPX4000LZ CO<sub>2</sub> Laser Glass Processor and the GPX3400 and GPX3600 Glass Fiber Processing Stations. Many of the fiber holder inserts that are compatible with the LDC401 and LDC401A are also compatible with these fiber processing systems, making it easy to move the fiber between stations. We also offer the LDC450B Portable Fiber Cleaver, which features a rechargeable battery for versatility and ease of use in manufacturing and research environments.

\* It may not be possible to create clean, angled cleaves in specialty fibers with large "air-fill" fractions due to the structural properties of the fiber.

Compatible Vytran Fiber Processing Systems

Fiber Preparation Station (Strip and Clean)	Large-Diameter Fiber Cleavers	Portable Large-Diameter Fiber Cleavers	Large-Diameter Fiber Splicer	CO <sub>2</sub> Laser Glass Processing System (Splice and Taper)	Automated Glass Processing Systems with Integrated Cleaver (Cleave, Splice, and Taper)	Automated Glass Processing Systems (Splice and Taper)	Recoaters, Proof Testers, and Recoaters with Proof Testers
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## SPECS

Specifications		
Item #	LDC401	LDC401A
		Flat Cleave or

<b>Cleave Type</b>	Flat Cleave	Angled <sup>a</sup> Cleave up to 15°
<b>Accepted Fiber Sizes</b>	Cladding: Ø80 µm to Ø1.25 mm Buffer: Ø80 µm to Ø3.198 mm	
<b>Accepted Fiber Types</b>	SM, PM, MM, Specialty Fibers Including Microstructured Fiber, Photonic Crystal Fiber (PCF), Non-Circular Fiber, and Capillary Tubes	
<b>Cleave Method</b>	Tension and Scribe	
<b>Tension</b>	63.7 N (14.3 lbs) Max, Programmable <sup>b</sup>	
<b>Scribe</b>	Diamond Blade, Stepper Motor Controlled (5000 Uses, 9 Positions)	
<b>Loading</b>	Linear Tension, Stepper Motor Controlled	
<b>Cleave Tolerance</b>	±0.5°	±0.5° (Flat) ±1.0° (Angled)
<b>Rotation Stage</b>	N/A	0.1° Resolution, Stepper Motor Controlled
<b>Fiber Holding Blocks</b>	Internal Vacuum Pump for Easier Loading, Up to 9 inHg (4.4 psi) of Pressure	
<b>Fiber Holder Inserts</b>	Available Separately Below	
<b>Power</b>	12.5 VDC, 5 A (Provided by External Power Supply)	
<b>External Power Supply</b>	100 - 120 / 200 - 240 VAC, 4.5 / 2.2 A, 47 - 63 Hz	
<b>Dimensions (L x W x H) without Holding Blocks or Rotation Stage</b>	10.14" x 5.30" x 5.15" (257.4 mm x 134.6 mm x 130.7 mm)	
<b>Dimensions (L x W x H)</b>	10.14" x 5.30" x 6.82" (257.4 mm x 134.6 mm x 173.3 mm)	10.14" x 5.30" x 6.96" (257.4 mm x 134.6 mm x 176.8 mm)
<b>Weight</b>	10.0 lbs (4.5 kg)	

- It may not be possible to create clean angled cleaves in specialty fibers with large "air-fill" fractions due to the structural properties of the fiber.
- These cleavers are calibrated using standard weights that are hung off of a pulley, so the tension settings are programmed into the tablet controller in grams. This maximum tension corresponds to 6.5 kg.



## Programmable Cleave Parameters

These large-diameter fiber cleavers are designed to provide easy operation when performing simple cleaves but still support customized processing for more complicated cleaves involving specialty fibers. A complete list of modifiable parameters is listed below. The majority of users will only need to enter the Fiber Diameter (cladding), Cleave Tension, and Pre-Cleave Advance while leaving the rest of the parameters set to their default values. To further simplify the process, the tablet controller features an autaset function that will estimate an appropriate Cleave Tension and Pre-Cleave Advance based on the fiber diameter, although these values can be adjusted by the user if necessary.

Fiber Cleaver Parameter Limits			
Parameter	Default	Minimum	Maximum
<b>Fiber Diameter</b>	Fiber Size Dependent	10 µm	1500 µm
<b>Cleave Tension<sup>a,b</sup></b>	Fiber Size Dependent	1 g	6500 g
<b>Pre-Cleave Advance</b>	Fiber Size Dependent	200 Steps (300 µm)	400 Steps (600 µm)
<b>Set FHB Offset</b>	0 mm	0 mm	47 mm
<b>Tension Velocity</b>	60 Steps/s (48 µm/s)	4 Steps/s (3.2 µm/s)	200 Steps/s (160 µm/s)
<b>Rotation Angle (LDC401A Only)</b>	0°	0°	180°
<b>Cleave Peck Cycles</b>	60	10	250

<b>Cleave Forward Steps</b>	81	40	400
<b>Cleave Back Steps</b>	80	39	399
<b>Scribe Delay</b>	250 ms	1 ms	5000 ms
<b>Set Blade Offset</b>	Unit Specific Value	100 Steps (150 µm)	2500 Steps (3750 µm)
<b>Sub-Critical Process Parameters<sup>c</sup></b>			
<b>Re-Tension Level<sup>a,d</sup></b>	10 g	1 g	100 g
<b>Post-Scribe Pause</b>	1.0 s	0.1 s	30.0 s
<b>Re-Tension Pause</b>	1.0 s	0.1 s	30.0 s
<b>Re-Tension Limit</b>	20% of Cleave Tension	1% of Cleave Tension	50% of Cleave Tension

- These cleavers are calibrated using standard weights that are hung off of a pulley, so the tension settings are programmed into the tablet controller in grams.
- This corresponds to a range of tensions from 9.8 mN (0.0022 lbs) to 63.7 N (14.3 lbs).
- These parameters only appear in the controller when the sub-critical process is enabled.
- This corresponds to a range of tensions from 9.8 mN (0.0022 lbs) to 0.98 N (0.22 lbs). The default value corresponds to 98 mN (0.022 lbs).

### Tablet Controller Cleave Parameter Definitions

The definition of each of the parameters that can be entered into the tablet controller are described below.

**Fiber Diameter:** The diameter of the fiber cladding. This is also the fiber cleave parameter file name.

**Cleave Tension:** The load applied axially to the fiber prior to initiating the scribe process. These cleavers are calibrated using standard settings that are hung off of a pulley, so the tension settings are programmed into the tablet controller in grams. Possible settings correspond to a range of tensions from 9.8 mN (0.0022 lbs) to 63.7 N (14.3 lbs).

**Pre-Cleave Advance:** Before cleaving, the cleave blade must move closer to the fiber. The location of the blade just prior to cleaving is set using this parameter. One step corresponds to 0.00006" (1.5 µm).

**Set FHB Offset:** This stands for "Set Fiber Holding Block Offset". It is the distance that the left fiber holding block will be shifted to the left from the "home" position prior to loading the fiber. This allows the user to adjust the distance between the edge of the holding block and the cleave point.

**Tension Velocity:** The speed at which tension is applied to the fiber prior to cleaving. One step corresponds to 0.00003125" (0.8 µm).

**Cleave Peck Cycles:** To properly cleave the fiber, the cleave blade will ideally make one single, quick contact with the fiber. In order to achieve this, the blade will begin to oscillate forward and backwards after the pre-cleave advance distance has been traveled. This parameter sets the total number of oscillations that will occur during the cleave process.

**Cleave Forward Steps:** This parameter controls how far the blade moves towards the fiber during the "forward" portion of the cleave peck cycle. One step corresponds to 0.00006" (1.5 µm).

**Cleave Back Steps:** This parameter controls how far the blade moves away from the fiber during the "backward" portion of the cleave peck cycle. One step corresponds to 0.00006" (1.5 µm).

**Scribe Delay:** This is the delay in milliseconds between each cleave peck cycle. It provides time for the scribe to propagate across the fiber, completing the cleave, before the blade moves forward again. This helps prevent the blade from contacting the fiber more than once.

**Set Blade Offset:** Adjusts the position that the blade returns to after homing. This allows the starting point for the pre-cleave advance and subsequent cleave peck cycles to be globally adjusted. One

step corresponds to 0.00006" (1.5 μm).

## Special Sub-Critical Process Parameters

During the Sub-Critical Process, additional tension is applied to the fiber after the scribe occurs.

**Post-Scribe Pause:** The time, in seconds, between the last oscillation of the cleave blade and the first increase in tension applied to the fiber.

**Re-Tension Pause:** The time between subsequent increases in the tension applied to the fiber (all increases in tension after the first one, which occurs after the Post-Scribe Pause).

**Re-Tension Level:** The tension is increased incrementally after the scribe. This is the amount by which the tension is increased after the Post-Scribe Pause and each Re-Tension Pause. These cleavers are calibrated using standards weights that are hung off of a pulley, so the tension settings are programmed into the tablet controller in grams. Possible settings correspond to a range of tensions from 9.8 mN (0.0022 lbs) to 0.98 N (0.22 lbs).

**Re-Tension Limit:** The maximum amount of additional tension that will be applied to the fiber as a percentage of the original tension.

## FIBER HOLDER INSERTS

### Fiber Holder Insert Selection Guide

Fiber Holder Inserts, which are designed to hold various sized fibers within the cleaver, must be purchased separately. The bottom inserts have V-grooves to hold the fiber, while the top inserts each feature a recessed, flat surface that clamps the fiber against the V-groove in the bottom insert. Each top and bottom insert is sold individually, as the fiber diameter clamped by the left and right holding blocks may not be the same. Two top inserts and two bottom inserts are required to operate the cleaver.

The table below indicates the maximum and minimum diameters that can be accommodated by different combinations of top and bottom inserts. It also indicates how far offset the fiber will be for recommended combinations of top and bottom inserts. Note that the fiber outer diameter may be the fiber cladding, jacket, or buffer. If one side of the fiber is being discarded, it is preferable to clamp onto the cladding of this section except in special cases (such as non-circular fiber) where the coating or buffer may be preferable. Sections of fiber that are not being discarded should always be clamped on the coating or buffer in order to avoid damaging the glass. This may require different sets of fiber holder inserts to be used in the left and right holding blocks. In this case, it is important to minimize the difference in the offsets introduced by the left and right sets of inserts when attempting to produce perpendicular, flat cleaves.




### Fiber Holder Insert Selection Chart

1. **First, select the bottom insert that matches your fiber size most closely.**

**Example:** For an Ø800 μm fiber, the VHD750 insert is the closest match, since it is only 50 μm smaller.

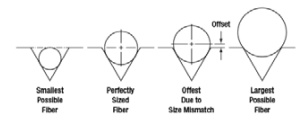
2. **On the chart below, look to the right of your chosen bottom insert. Select a compatible top insert based on the fiber diameter size range shown in each cell.**

**Example:** For the Ø800 μm example fiber from step 1, the green cell is in the 750 μm groove column for the VHA05 top insert which has two grooves. The numbers listed in the green cell indicate that this combination of inserts is good for fibers from 728 to 963 μm in diameter. Our Ø800 μm fiber is within this range, so this is a good choice. There are several other options as well that will accommodate an Ø800 μm fiber as well, but the green shading in the chart indicates that the 750 μm groove in the VHA05 provides the best fit.

Legend	
	Best Fit
	Second Best Fit: Try these options if the best fit does not incorporate your fiber sizes.
	Third Best Fit: Try these options if the other two categories do not incorporate your fiber sizes.

3. **The second line of numbers in each cell shows the range of offsets that can be expected for any given combination of top and bottom inserts. When selecting inserts for the right and left fiber holding blocks, try to minimize the offsets between the pairs of inserts on each side.**

**Example:** If we choose a VHD750 bottom insert and the Ø750 μm groove in the VHA05 top insert, we can use fiber as small as 728 μm, in which case the center of the fiber would sit 23 μm below the surface of the bottom insert. We could also clamp a fiber as large as 963 μm, in which case the center of the fiber would sit 213 μm above the surface of the bottom insert. We could interpolate to find the offset experienced by our hypothetical 800 μm fiber, but it turns out that in the 60° V-groove on these inserts, the offset is equal to the diameter difference. So in our example, that means



Each V-groove can accommodate a range of fiber sizes.

that the center of our fiber is going to sit 50 µm above the bottom insert surface, since it is 50 µm larger than the fiber that the bottom insert was designed for (800 - 750 = 50).

4. **Holding blocks designed for fibers less than Ø1000 µm have vacuum holes, designed to aid in aligning small fiber within the groove, while bottom inserts for fibers of Ø1000 µm or larger do not have these holes.** The LDC4010 and LDC401A each have a vacuum pump that provides a small holding force via these holes, keeping small fibers in place as the clamps are lowered. Inserts with vacuum holes are indicated by a superscript "b" in the table below.

Top Insert Item #		VHA00 <sup>a</sup>		VHA05 <sup>a</sup>		VHA10 <sup>a</sup>		VHA15 <sup>a</sup>		VHA20 <sup>a</sup>		VHA25	VHA30
Accepted Diameter (Nominal)		≤320 µm	400 µm	500 µm	750 µm	1000 µm	1250 µm	1500 µm	1750 µm	2000 µm	2250 µm	2500 µm	3000 µm
Bottom Insert Item #	Accepted Diameter (Nominal)	Min / Max Accepted Fiber Diameter (µm) Min / Max Fiber Offset (µm)											
		VHD080 <sup>b</sup>	80 µm	57 / 100 -23 / 21	-	-	-	-	-	-	-	-	-
VHD125 <sup>b</sup>	125 µm	88 / 161 -37 / 36	-	-	-	-	-	-	-	-	-	-	-
VHD160 <sup>b</sup> or VHF160 <sup>b,c</sup>	160 µm	112 / 208 -49 / 48	-	-	-	-	-	-	-	-	-	-	-
VHD250 <sup>b</sup> or VHF250 <sup>b,c</sup>	250 µm	177 / 320 -73 / 69	275 / 323 25 / 74	-	-	-	-	-	-	-	-	-	-
VHD400 <sup>b</sup> or VHF400 <sup>b,c</sup>	400 µm	279 / 519 -122 / 119	377 / 517 -23 / 117	410 / 519 -9 / 119	-	-	-	-	-	-	-	-	-
VHD500 <sup>b</sup> or VHF500 <sup>b,c</sup>	500 µm	346 / 592 -153 / 93	447 / 647 -53 / 147	476 / 711 -24 / 211	560 / 795 61 / 296	-	-	-	-	-	-	-	-
VHD750 <sup>b</sup> or VHF750 <sup>b,c</sup>	750 µm	516 / 759 -234 / 9	617 / 970 -132 / 221	643 / 878 -107 / 128	728 / 963 -23 / 213	812 / 1047 62 / 297	-	-	-	-	-	-	-
VHE10 <sup>a</sup>	1000 µm	-	-	773 / 1008 -172 / 63	858 / 1093 -88 / 147	943 / 1178 -3 / 232	1036 / 1271 90 / 325	-	-	-	-	-	-
	1250 µm	-	-	-	1034 / 1269 -176 / 59	1119 / 1354 -91 / 144	1212 / 1447 2 / 237	1288 / 1523 78 / 313	-	-	-	-	-
VHE15 <sup>a</sup>	1500 µm	-	-	-	-	1280 / 1515 -172 / 63	1373 / 1608 -79 / 156	1449 / 1684 -2 / 233	1534 / 1769 82 / 314	-	-	-	-
	1750 µm	-	-	-	-	-	1534 / 1770 -159 / 76	1611 / 1846 -83 / 152	1695 / 1930 2 / 237	1772 / 2007 78 / 313	-	-	-
VHE20 <sup>a</sup>	2000 µm	-	-	-	-	-	-	1787 / 2022 -171 / 64	1871 / 2106 -86 / 149	1947 / 2183 -10 / 225	2032 / 2267 74 / 309	-	-
	2250 µm	-	-	-	-	-	-	-	2033 / 2268 -167 / 68	2109 / 2344 -91 / 144	2193 / 2429 -6 / 229	2278 / 2513 78 / 313	-
VHE25	2500 µm	-	-	-	-	-	-	-	-	2270 / 2505 -172 / 64	2355 / 2590 -87 / 148	2439 / 2675 -2 / 233	2609 / 2844 167 / 402

VHE30	3000 $\mu\text{m}$	-	-	-	-	-	-	-	-	-	2692 / 2944 -256 / -4	2777 / 3029 -171 / 81	2946 / 3198 -2 / 250
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- These inserts have two grooves, one on each side, that each accommodate a different range of fiber sizes, except for the VHA00, which has a flat surface on one side that can be used to clamp the smallest fiber sizes.
- These bottom inserts have vacuum holes to aid in aligning small fibers when used with the large-diameter fiber cleavers.
- These are transfer inserts. When used with the VHT1 transfer clamp, they allow the fiber to be transferred between compatible stripping, cleaning, cleaving, splicing, and tapering stations without losing registration of the fiber tip location relative to the edges of the fiber holding block.

## CLEAVING GUIDE

### Tension-and-Scribe Cleave Process

The LDC401 cleavers use the "tension-and-scribe" cleaving process, where tension is applied along the length of the fiber followed by an automatic scribing process utilizing a diamond blade. After the blade scribes the fiber, tension is maintained, causing the scribe to propagate across the fiber width and complete the cleave. Angled cleaves are accomplished in the LDC401A by using the rotation stage to apply torsion to the fiber, starting prior to commencing the "tension-and-scribe" process. The cleave plane will then be perpendicular to the maximum resultant stress created by the combined tension and torsion applied to the fiber.

### Sub-Critical Process for Cleaving Specialty Fibers

Certain specialty fibers, such as photonic crystal fiber (PCF), microstructured fibers, capillary tubes, or highly stressed fibers (multimode or polarization maintaining) may require special parameters in order to create clean cleaves at the desired angle. These Vytran<sup>®</sup> fiber cleavers can be programmed with a "sub-critical" cleave process in order to produce high-quality cleaves for these fiber types.

For these cleaves, the initial tension applied to the fiber is lower than what would be required for the standard "tension-and-scribe" process. The included micrometer backstop prevents the fiber from bending when it is scribed at this lower tension. After the scribe, the tension is slowly, incrementally increased, which serves to propagate the scribe across the fiber and complete the cleave. Parameters for this process can be adjusted using the tablet controller, including the starting and ending tension and how fast the tension is increased after the initial scribe.

### Cleaving Guide

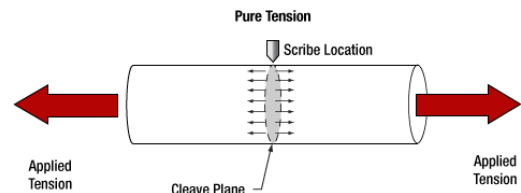
The following information is intended to provide a starting point when selecting the best process to use for cleaving different types of fiber. To achieve the best possible cleave results, further experimentation is typically required to fine-tune the cleave parameters for each specific fiber type.

**Standard Process:** The tension-and-scribe method where a constant tension is applied to the fiber, the fiber is scribed, and the tension causes the scribe to propagate across the fiber to produce the cleave.

**Sub-Critical Process:** This process starts with a lower tension applied to the fiber than required by the standard cleaving process. After the fiber is scribed, the tension is slowly increased until the scribe propagates across the fiber and the cleave is complete. This can improve the cleave quality in highly stressed or specialty fibers.

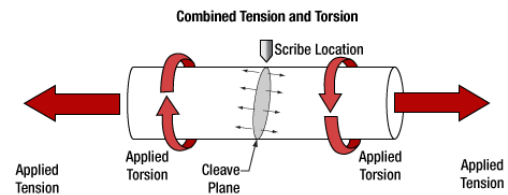
**Micrometer Backstop:** The tip of the micrometer is positioned so that it just touches the fiber, providing a surface that prevents the fiber from deforming when contacted by the cleave blade during scribing. It is particularly useful when cleaving large-diameter fibers or when using the lower-tension sub-critical process.

### Tension-and-Scribe Cleave Process



Click to Enlarge

An illustration of the tension-and-scribe method as used by the LDC401 and LDC401A to produce a flat cleave. Tension is applied along the optical axis of the fiber prior to cleaving. A diamond blade then scribes the fiber, and the tension causes the scribe to propagate across the fiber in a plane that is orthogonal to the direction of the tension.



Click to Enlarge

An illustration of the tension-and-scribe method as used by the LDC401A to produce an angled cleave. Tension and torsion are applied simultaneously to the fiber prior to cleaving. When the blade scribes the fiber, the scribe propagates across the fiber orthogonally to the direction of the maximum resultant stress produced by the combined tension and torsion, producing an angled cleave.



Fiber Type	Cleave Type	Standard Process	Sub-Critical Process	Micrometer Backstop
Fiber with Cladding <math>\leq \varnothing 800 \mu\text{m}</math>	Flat or Angled <sup>a</sup>	✓	-	-
Fiber with Cladding $\geq \varnothing 800 \mu\text{m}$	Flat or Angled <sup>a</sup>	✓	May Be Necessary	Use if the Cleave Blade is Pushing the Fiber Forwards without Cleaving
Multimode Fiber	Flat	✓	-	-
	Angled <sup>a</sup>	-	✓	Use if Fiber Cladding is $> \varnothing 400 \mu\text{m}$
Thick-Walled Capillary Tubing (Wall Thickness at Least 10% of Diameter)	Flat or Angled <sup>a</sup>	-	-	✓
Thin-Walled Capillary Tubing (Wall Thickness $< 10\%$ of Diameter)	Flat or Angled <sup>a</sup>	-	✓	✓
PM Fiber	Flat	Use if Fiber Cladding is $\leq \varnothing 400 \mu\text{m}$	Use if Fiber Cladding is $> \varnothing 400 \mu\text{m}$	✓
	Angled <sup>a</sup>	-	✓	✓
PCF	Flat or Angled <sup>a</sup>	-	✓	✓

- Only the LDC401A can be used to produce angled cleaves.

## CONTROLLERS

Two controller options are available: the tablet controller included with each fiber cleaver or the VYT300C handset controller. Some examples of the GUI for each controller are shown and described below.

### Tablet Controller GUI Interface

Each LDC401 and LDC401A includes a touchscreen tablet controller, which provides a simple interface for configuring, controlling, and monitoring cleaver operation. The screenshots below highlight key features of the graphical user interface. Additionally, the user can open, save, import, export, or delete files using the file explorer application on the tablet. The user can also enter passwords and set permissions, allowing only authorized users to access and change the LDC401 or LDC401A settings. The controller can be operated in one of four languages: English, French, Russian, or Chinese. The controller may be mounted above the cleaver using the LDCCM Kit below (sold separately), which also includes an inspection microscope.

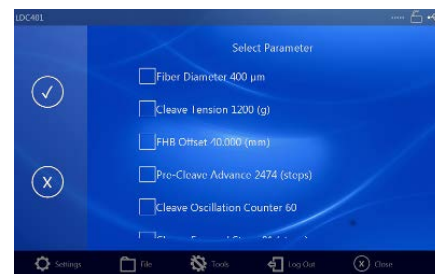


Click to Enlarge  
**Home Screen**

The LDC401 home screen provides a status bar, tool bar, start button, and a button to view or edit the parameters. The symbols on the right of the screen make up the LDC Widget.

Top row, left to right: left FHB inserts, FHB offset in mm, cleave blade index, cleave counter, right FHB inserts, rotation angle.

Bottom row, left to right: target tension, fiber cladding and jacket diameter, micrometer backstop position, regular or sub-critical cleave, ready/busy indicator.



Click to Enlarge  
**Cleave Parameters**

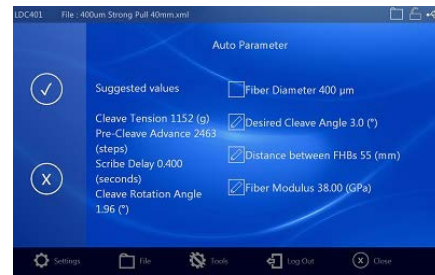
This screen allows the user to access and change all cleave parameters. The current setting is displayed next to the parameter name.





Click to Enlarge  
**Cleave Process Screen**

Once the cleave process is started, the Cleave Screen is displayed. This screen updates dynamically as the cleave sequence progresses. A typical sequence consists of loading the fiber, pulling tension, cleaving the fiber, and then unloading (although the user can go straight to the tension stage by pressing start when the left FHB lid is closed). This screen shows the LDC widget, allowing the user to make final adjustments to parameters before the cleave.



Click to Enlarge  
**Automatic Settings**

Auto Parameter will generate a basic set of suggested theoretical cleave parameters based on the Fiber Diameter (and if required, the Desired Cleave Angle). The user can edit each parameter by touching the item in the list.



Click to Enlarge  
**Motor Control**

This window allows the user to adjust the desired position of the fiber holding block, either by typing in a new setting, using the slider, or using the arrow buttons beneath the slider. While this window is for the fiber holding block, similar windows are available to set the position of the motor that drives the cleave blade and the rotation stage for angle cleaves (LDC401A only).



Click to Enlarge  
**Blade Service**

The blade service window allows the user to move the blade between its service position and its home position. The screen includes a list of the parameters needed to manage the blade setup. The cleave counter counts the number of cleaves performed by the blade in a given position. Each time the blade is replaced or moved so that a new part of the blade is in use, the cleave counter should be reset to zero and the cleave blade index incremented by 1. These can be done by tapping the boxes next to "Cleave Blade Index" and "Cleave Counter."

## Handset Controller GUI Interface

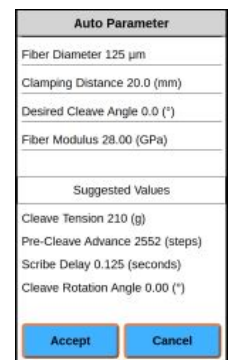
The VYT300C handset controller is offered as an alternative to the included tablet controller. It is compatible with Vytran large-diameter fiber cleavers as well as Vytran PTR fiber recoaters and proof testers. One handset controller can be used to configure parameters on multiple fiber processing units in succession. Full instructions for using the handset controller can be found in the manual. The screenshots below highlight key features of the graphical user interface.



Click to Enlarge  
The initial screen on VYT300C handset controller prompts the user to load the fiber, as well as providing the options to start a cleave with the displayed parameters and to home the fiber holding blocks. Other menus can be accessed by swiping the touchscreen left or right, or by tapping the options at the top of the screen.



Click to Enlarge  
During a cleave, the handset controller monitors the cleave tension and the number of cleave peck cycles. It also displays parameters defined in the edit tab.



Click to Enlarge  
The Auto Parameter screen, accessible under the Tools menu, provides suggested values for cleave tension, pre-cleave advance, scribe delay, and cleave rotation angle based on user-defined parameters for fiber diameter, clamping distance, desired cleave angle, and fiber modulus.



Click to Enlarge  
 The Blade Service screen, accessible under the Tools menu, moves the blade motor forward by an amount equal to the Blade Offset plus the Pre-Cleave Advance. This can be done in order to clean, replace, or inspect the blade.



Click to Enlarge  
 The Edit menu shows parameters that can be configured by the user. These parameters are the same as those that can be edited using the tablet controller.



Click to Enlarge  
 The handset controller can open, save, delete, export, and import files containing parameters for compatible systems. Exporting or importing a file will require a memory device to be connected to the Program Port of the handset controller.

PRODUCT DEMOS



Product Demonstrations

Thorlabs has demonstration facilities for the Vytran® fiber glass processing systems offered on this page within our Morganville, New Jersey; Exeter, Devonshire; and Shanghai, China offices. We invite you to schedule a visit to see these products in operation and to discuss the various options with a fiber processing specialist. Please schedule a demonstration at one of our locations below by contacting technical support. We welcome the opportunity for personal interaction during your visit!

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## Fiber Cleavers for Ø80 µm to Ø1.25 mm Cladding Fibers

- ▶ Cleave Fibers with Claddings from Ø80 µm to Ø1.25 mm
  - ▶ LDC401: Flat Cleaves Only
  - ▶ LDC401A: Flat Cleaves or Angled Cleaves up to 15°
- ▶ Accepts SM, MM, PM, and Specialty Fibers
- ▶ Includes Micrometer Backstop to Support Low-Tension Cleave Processes
- ▶ Diamond Cleave Blade
- ▶ Fiber Holder Inserts Must be Purchased Separately (Available Below)

### Components

#### Included

- LDC401 or LDC401A
- Tablet Controller and Tablet Stand
- 12 V Power Supply
- Location-Specific AC Power Cord
- Nylon Brush
- 0.035", 0.050", and 3/32" Hex Keys

#### Must be Purchased Separately

- Fiber Holder Top Inserts (Two Required)
- Fiber Holder Bottom Inserts (Two Required)

#### Optional Accessories (Sold Separately)

- Handset Controller
- Digital Microscope and Tablet Mount
- Replacement Diamond Cleave Blade
- Replacement SS2SN013 Setscrews for Fiber Holding Blocks



LDC401  
Click to Enlarge

The Vytran LDC401 and LDC401A Fiber Cleavers produce high-quality cleaves in fibers with claddings from Ø80 µm to Ø1.25 mm in order to support precision splicing applications.

The LDC401 produces flat cleaves (i.e., a cleave plane perpendicular to the length of the fiber), while the LDC401A can produce both flat and angled cleaves. Each cleaver features a diamond cleave blade, a micrometer backstop that enables low-

tension cleaves in specialty fibers, and a ruler block and translating fiber holding blocks to align the point to be cleaved. The LDC401A also includes a rotary stage to apply the torsion needed for angled cleaves.

The left fiber holding block is connected to the same motorized stage as is used in our linear proof testers and includes a load cell that allows the system to internally monitor the tension applied to the fiber during the cleave process. The position of this holding block can be adjusted prior to cleaving by entering the desired position, with micron-level precision, into the tablet controller (display units are in millimeters).

The tablet included with each cleaver allows the parameters of the cleave process to be precisely controlled. Adjustable settings include the fiber tension, rotation angle, velocity at which the tension and torsion are applied to the fiber, how quickly the scribe approaches the fiber, and fiber diameter. A cleave angle calculator, included in the LDC401A tablet, provides an estimate of cleave parameters that can be refined by the user. The tablet is shipped preloaded with ten files for common cleave parameters. See the *Controllers* tab for details.

Once the desired cleave parameters are set and loaded into the cleaver, the tablet can be removed and the cleaving process initiated by pressing the blue button on the top of the unit. For manufacturing environments with multiple cleaving stations, this feature streamlines the production process by allowing the same cleave parameters to be easily loaded into multiple LDC401 cleavers.

These cleavers use fiber holding blocks that are compatible with the FPS300 Stripping and Cleaning Station, LFS4100 Fiber Splicer, GPX3000 Glass Fiber Processing Stations, and GPX4000LZ CO<sub>2</sub> Laser Glass Processor, allowing fiber to be moved easily between systems. Fiber Holder Inserts are available below in a variety of sizes and must be purchased separately. Nylon-tipped setscrews are used to secure the inserts in the fiber holding blocks; replacement 2-56, 1/8" long SS2SN013 setscrews are available in packs of 10. A selection guide is provide on the *Fiber Holder Inserts* tab to aid in determining which inserts are appropriate for the fiber to be cleaved.

Each unit is shipped with a power supply and location-specific power cord.

Note: Due to the unit's design, it is not possible to upgrade an LDC401 to perform angled cleaves.

Part Number	Description	Price	Availability
-------------	-------------	-------	--------------

LDC401	Large-Diameter Fiber Cleaver, Ø80 µm to Ø1.25 mm Cladding, Flat Cleaves	\$11,457.72	Lead Time
LDC401A	Large-Diameter Fiber Cleaver, Ø80 µm to Ø1.25 mm Cladding, Flat and Angled Cleaves	\$13,632.57	Lead Time

## Handset Controller

- ▶ Alternative to Tablet Controller
- ▶ Provides Full Functionality for Compatible Systems (See Compatible Systems List to the Right)
- ▶ Intuitive GUI
- ▶ Capacitive Touchscreen
- ▶ Smaller Footprint than Tablet Controller

### Compatible Systems

- LDC401(A) Fiber Cleavers
- LDC450B Portable Fiber Cleaver (Included with this Unit)
- PTR303(B), PTR304(B), PTR306(B), and PTR307(B) Manual Mold Fiber Recoaters
- PTR305 and PTR308 Automatic Mold Fiber Recoaters
- PTR403(B) Fiber Recoaters (Included with These Units)
- PTR301 and PTR302 Fiber Proof Tester



Click to Enlarge Screenshot of VYT300C Controller When Used with LDC401 Fiber Cleaver

This handset controller is available as an alternative to the tablet controller included with our Vytran Large Diameter Fiber Cleavers, PTR Series Fiber Recoaters, and PTR Series Fiber Proof Testers. One handset controller is included with each PTR403 and PTR403B recoater, as well as the LDC450B portable fiber cleaver. A single handset controller can be used with multiple systems; after configuring parameters to one fiber processing unit, the controller can be disconnected and then connected to a different unit, of the same or a different type, to configure its parameters.

The handset controller must be connected via the included cable in order to use it. The controller automatically turns on when the connected system is turned on. Upon startup, the handset controller will always read parameters from the connected system; i.e., the parameters that appear on the screen will always be the parameters that have been uploaded to the connected unit. If the parameters read from the unit match the parameters of the most recently opened file on the handset controller, the screen will display the file name.

In addition to the Open File, Save File, and Save File As options available with the tablet controller, the handset controller allows files to be deleted, exported, and imported. Exporting or importing a file will require a memory device to be connected to the Program Port of the handset controller.

Instructions for using this controller can be found in the manuals for the compatible Vytran systems. The VYT300C controller cannot be used to control the digital microscope in the LDCCM and LDCCK kits sold below.

Part Number	Description	Price	Availability
VYT300C	Handset Controller for LDC401(A) Cleavers, LDC450B Portable Cleaver, PTR30x(B) and PTR403(B) Recoaters, and PTR30x Proof Testers	\$895.00	Lead Time

## Fiber Holder Top Inserts - Two Required

- ▶ Two are Required to use the Large-Diameter Fiber Cleavers
- ▶ Flat, Recessed Surface Clamps the Fiber Against the V-Groove in the Bottom Insert (Sold Below)
- ▶ Clamp Fiber Outer Diameters from 57 µm to 3.198 mm When Used with Bottom Inserts
- ▶ Compatible with Other Vytran Systems
  - ▶ FPS300 Fiber Preparation Station
  - ▶ LFS4100 Splicer
  - ▶ GPX3400 and GPX3600 Glass Fiber Processing Stations
  - ▶ GPX4000LZ CO<sub>2</sub> Laser Glass Processor

Fiber Holder Top Inserts <sup>a</sup>		
Item #	Side 1 Min/Max Accepted Diameter	Side 2 Min/Max Accepted Diameter
VHA00	57 µm / 759 µm <sup>b</sup>	275 µm / 970 µm
VHA05	410 µm / 1008 µm	560 µm / 1269 µm
VHA10	812 µm / 1515 µm	1036 µm / 1770 µm
VHA15	1288 µm / 2022 µm	1534 µm / 2268 µm
VHA20	1772 µm / 2505 µm	2032 µm / 2944 µm
VHA25	2278 µm / 3029 µm	N/A
VHA30	2609 µm / 3198 µm	N/A

- Please see the *Fiber Holder Inserts* tab for information on how to match top and bottom inserts to achieve the best cleave quality.
- This side of the VHA00 is flat to provide additional clamping force for fibers with

► Interchangeable by the User

very small diameters.

The large-diameter fiber cleavers require a pair of Top and Bottom Fiber Holder Inserts to be placed in each of the fiber holding blocks in order to clamp the fiber during the cleaving process. Each top insert consists of a bar that has a recessed area on one or both sides, designed to clamp the fiber against the V-groove in a bottom insert. The inserts sit in the top section of the fiber holding blocks and are available in a variety of groove sizes. Top inserts are sold individually, and two are required to use these cleavers.

The top and bottom inserts (available below) can be paired in different combinations, outlined on the *Fiber Holder Inserts* tab above, to accommodate fiber with outer diameters from 57 µm to 3.198 mm.

While the cleavers can only cleave fibers with cladding diameters from 80 µm up to 1.25 mm, the inserts can accommodate a wider range of outer diameters, as there are cases where the fiber should be clamped on the coating instead of the cladding. During a typical cleave, it is often desirable to clamp the cladding on the side to be discarded and the coating on the side of the fiber that will be retained. Alternatively, the fiber may be center stripped and the coating clamped on both sides (preferable in some cases, such as creating a firm clamp on non-circular fiber). Therefore, multiple combinations of top and bottom inserts may be required to accommodate all of the diameters that need to be clamped. The *Fiber Holder Insert* tab above includes information and a table to aid in selecting the correct combinations of top and bottom inserts to accommodate fiber outer diameters between 57 µm and 3.198 mm.

Part Number	Description	Price	Availability
VHA00	Dual-Sided Fiber Holder Top Insert, Ø57 µm - Ø970 µm	\$172.06	Today
VHA05	Dual-Sided Fiber Holder Top Insert, Ø410 µm - Ø1269 µm	\$172.06	Today
VHA10	Dual-Sided Fiber Holder Top Insert, Ø812 µm - Ø1770 µm	\$172.06	Today
VHA15	Dual-Sided Fiber Holder Top Insert, Ø1288 µm - Ø2268 µm	\$172.06	Today
VHA20	Dual-Sided Fiber Holder Top Insert, Ø1772 µm - Ø2944 µm	\$172.06	Today
VHA25	Fiber Holder Top Insert, Ø2278 µm - Ø3029 µm	\$172.06	Today
VHA30	Fiber Holder Top Insert, Ø2609 µm - Ø3198 µm	\$172.06	Today

### Fiber Holder Bottom Inserts - Two Required

- Two are Required to Use the LDC401 or LDC401A
- Clamp Fiber Outer Diameters from 57 µm to 3.198 mm when Used with Top Inserts (Available Above)
- VHD and VHF Series of Inserts Have Holes for Vacuum Suction to Aid in Positioning Small Fibers when Used in the LDC401 or LDC401A (See the Table to the Right)
- VHF Transfer Inserts are Used with VHT1 Transfer Clamp to Aid in Transferring a Fiber with ≤Ø1.047 mm Coating between Compatible Vytran Systems
  - FPS300 Fiber Preparation Station
  - LFS4100 Splicer
  - GPX3400 and GPX3600 Glass Fiber Processing Stations
  - GPX4000LZ CO<sub>2</sub> Laser Glass Processor
- Interchangeable by the User

Fiber Holder Bottom Inserts <sup>a</sup>				
Item #	Transfer Insert	Side 1 Min/Max Accepted Diameter	Side 2 Min/Max Accepted Diameter	Vacuum Holes
VHD080	No	57 µm / 100 µm	N/A	Yes
VHD125	No	88 µm / 161 µm	N/A	Yes
VHD160	No	112 µm / 208 µm	N/A	Yes
VHF160	Yes <sup>b</sup>			
VHD250	No	177 µm / 323 µm	N/A	Yes
VHF250	Yes <sup>b</sup>			
VHD400	No	279 µm / 519 µm	N/A	Yes
VHF400	Yes <sup>b</sup>			
VHD500	No	346 µm / 795 µm	N/A	Yes
VHF500	Yes <sup>b</sup>			
VHD750	No	516 µm / 1047 µm	N/A	Yes
VHF750	Yes <sup>b</sup>			
VHE10	No	773 µm / 1271 µm	1034 µm / 1523 µm	No
VHE15	No	1280 µm / 1769 µm	1534 µm / 2007 µm	No
VHE20	No	1787 µm / 2267 µm	2033 µm / 2513 µm	No
VHE25	No	2270 µm / 2844 µm	N/A	No
VHE30	No	2692 µm / 3198 µm	N/A	No

The large-diameter fiber cleavers require a pair of Top and Bottom Fiber Holder Inserts to be placed in each of the fiber holding blocks in order to clamp the fiber during the cleaving process. Each bottom insert has a V-Groove on one or both sides that can accommodate a range of diameters (as indicated in the table to the right).

- Please see the *Fiber Holder Inserts* tab for information on how to match top and bottom inserts to achieve the best cleave quality.
- If using these cleavers with other compatible Vytran systems, a transfer insert may



Three types of bottom inserts are available for these large-diameter fiber cleavers. Standard bottom inserts for fiber with an outer diameter <math>\lt; \text{Ø}1.047 \text{ mm}</math> have vacuum holes to help position the fiber in the groove when loading the cleaver. For certain fiber diameters, we also offer transfer inserts (Item #s beginning with VHF) designed to work with the VHT1 transfer clamps (available below) that aid in moving the fiber between compatible Vytran stations while maintaining coarse alignment. The VHE series of fiber holder bottom inserts have a V-Groove on one (VHE25 and VHE30) or both sides (VHE10, VHE15, and VHE20) but do not include vacuum holes. The VHF transfer inserts and VHE bottom inserts can both be installed in other, compatible Vytran stations, although the VHE bottom inserts cannot be used with the VHT1 transfer clamp.

be used in place of the standard bottom insert. Combined with the VHT1 transfer clamp, the transfer inserts allow the fiber to be moved between compatible Vytran stations while maintaining coarse alignment.

Bottom inserts are sold individually, and two are required to use the large-diameter cleavers. If using the fiber cleaver as a stand-alone device, the VHD series or VHE series inserts will be sufficient. If using the cleavers with other compatible Vytran systems, the bottom insert in the left fiber holding block can be replaced with a transfer insert and VHT1 transfer clamp (available below) for certain fiber sizes, as indicated in the table to the right. Typically, these transfer inserts would only be used in the left fiber holder block, as the right fiber holding block usually clamps the side of the fiber that will be discarded. The right fiber holding block of the LDC401 can accept transfer inserts, if desired, while the right fiber holding block of the LDC401A is incompatible with the transfer inserts, due to the presence of the rotation stage.

The top (available above) and bottom fiber holder inserts can be paired in different combinations, outlined on the *Fiber Holder Inserts* tab above, to accommodate fiber with outer diameters from 57  $\mu\text{m}$  to 3.198 mm. While the cleavers can only cleave fibers with cladding diameters from 80  $\mu\text{m}$  up to 1.25 mm, the inserts can accommodate a wider range of outer diameters, as there are cases where the fiber should be clamped on the coating instead of the cladding. During a typical cleave, it is often desirable to clamp the cladding on the side to be discarded and the coating on the side of the fiber that will be retained. Alternatively, the fiber may be center stripped and the coating clamped on both sides (preferable in some cases, such as creating a firm clamp on non-circular fiber). Therefore, multiple combinations of top and bottom inserts may be required. The *Fiber Holder Inserts* tab above includes information and a table to aid in selecting the correct combinations of top and bottom inserts to accommodate fiber outer diameters from 57  $\mu\text{m}$  to 3.198 mm.

Part Number	Description	Price	Availability
VHD080	Fiber Holder Bottom Insert, $\text{Ø}57 \mu\text{m}$ - $\text{Ø}100 \mu\text{m}$	\$215.34	Today
VHD125	Fiber Holder Bottom Insert, $\text{Ø}88 \mu\text{m}$ - $\text{Ø}161 \mu\text{m}$	\$215.34	Today
VHD160	Fiber Holder Bottom Insert, $\text{Ø}112 \mu\text{m}$ - $\text{Ø}208 \mu\text{m}$	\$215.34	Today
VHF160	Fiber Holder Transfer Bottom Insert, $\text{Ø}112 \mu\text{m}$ - $\text{Ø}208 \mu\text{m}$	\$320.31	Today
VHD250	Fiber Holder Bottom Insert, $\text{Ø}177 \mu\text{m}$ - $\text{Ø}320 \mu\text{m}$	\$215.34	Today
VHF250	Fiber Holder Transfer Bottom Insert, $\text{Ø}177 \mu\text{m}$ - $\text{Ø}320 \mu\text{m}$	\$320.31	Today
VHD400	Fiber Holder Bottom Insert, $\text{Ø}279 \mu\text{m}$ - $\text{Ø}519 \mu\text{m}$	\$215.34	Today
VHF400	Fiber Holder Transfer Bottom Insert, $\text{Ø}279 \mu\text{m}$ - $\text{Ø}519 \mu\text{m}$	\$320.31	Today
VHD500	Fiber Holder Bottom Insert, $\text{Ø}346 \mu\text{m}$ - $\text{Ø}795 \mu\text{m}$	\$215.34	Today
VHF500	Fiber Holder Transfer Bottom Insert, $\text{Ø}346 \mu\text{m}$ - $\text{Ø}795 \mu\text{m}$	\$320.31	Today
VHD750	Fiber Holder Bottom Insert, $\text{Ø}516 \mu\text{m}$ - $\text{Ø}1047 \mu\text{m}$	\$215.34	Today
VHF750	Fiber Holder Transfer Bottom Insert, $\text{Ø}516 \mu\text{m}$ - $\text{Ø}1047 \mu\text{m}$	\$320.31	Today
VHE10	Dual-Sided Fiber Holder Bottom Insert, $\text{Ø}773 \mu\text{m}$ - $\text{Ø}1523 \mu\text{m}$	\$215.34	Today
VHE15	Dual-Sided Fiber Holder Bottom Insert, $\text{Ø}1280 \mu\text{m}$ - $\text{Ø}2007 \mu\text{m}$	\$215.34	Today
VHE20	Dual-Sided Fiber Holder Bottom Insert, $\text{Ø}1787 \mu\text{m}$ - $\text{Ø}2513 \mu\text{m}$	\$215.34	Today
VHE25	Fiber Holder Bottom Insert, $\text{Ø}2270 \mu\text{m}$ - $\text{Ø}2844 \mu\text{m}$	\$215.34	Today
VHE30	Fiber Holder Bottom Insert, $\text{Ø}2692 \mu\text{m}$ - $\text{Ø}3198 \mu\text{m}$	\$215.34	Today

### Fiber Transfer Clamp and Graphite V-Grooves - Required for VHF Transfer Bottom Inserts

- ▶ Transfer Clamp and Graphite Tips for Fiber Holder Transfer Bottom Inserts
- ▶ Transfer Clamps Required to Transfer Fibers in VHF Inserts Between Compatible Vytran Systems
  - ▶ FPS300 Cleaning and Stripping Station
  - ▶ LFS4100 Splicer
  - ▶ GPX3400 and GPX3600 Glass Fiber Processing Stations
  - ▶ GPX4000LZ CO<sub>2</sub> Laser Glass Processor

Graphite V-Grooves <sup>a</sup>	
Item #	Accepted Diameter (Min / Max)
VHG125	80 $\mu\text{m}$ / 125 $\mu\text{m}$
VHG125L	80 $\mu\text{m}$ / 125 $\mu\text{m}$
VHG200	150 $\mu\text{m}$ / 200 $\mu\text{m}$
VHG250	200 $\mu\text{m}$ / 250 $\mu\text{m}$
VHG300	250 $\mu\text{m}$ / 300 $\mu\text{m}$

Graphite V-Grooves for Supporting Fibers  $\leq 500 \mu\text{m}$   
During Splicing or Tapering

- ▶ V-Grooves Accept Diameters from  $80 \mu\text{m}$  to  $550 \mu\text{m}$

These Transfer Clamps and V-Grooves are used with the VHF Transfer Bottom Inserts sold directly above to move a single fiber between various Vytran systems with minimal loss of alignment. For example, a fiber can be placed in a transfer insert and cleaved using the LDC401. Then, the entire transfer insert and fiber can be moved to a splicer or glass processor for splicing.

The VHT1 clamp secures transfer inserts with a magnetic lid that prevents axial movement of the fiber and can be used to hold the insert during transport without touching the fiber itself. For fibers with diameters  $\leq 550 \mu\text{m}$ , a graphite V-groove is available to support the fiber when splicing (please see the size table to the right for more information). The graphite V-grooves are secured by tightening two setscrews on the transfer insert.

VHG350	300 $\mu\text{m}$ / 350 $\mu\text{m}$
VHG400	350 $\mu\text{m}$ / 400 $\mu\text{m}$
VHG450	400 $\mu\text{m}$ / 450 $\mu\text{m}$
VHG500	450 $\mu\text{m}$ / 500 $\mu\text{m}$
VHG550	500 $\mu\text{m}$ / 550 $\mu\text{m}$

- Graphite V-grooves are not required for fibers with diameters larger than  $550 \mu\text{m}$ .

Part Number	Description	Price	Availability
VHT1	Transfer Clamp with Magnetic Lid for Fiber Holder Transfer Inserts	\$248.89	Today
VHG125	Graphite V-Groove, $\varnothing 80 \mu\text{m}$ - $\varnothing 125 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG125L	Extended Graphite V-Groove, $\varnothing 80 \mu\text{m}$ - $\varnothing 125 \mu\text{m}$ , 0.594" Length	\$154.75	5-8 Days
VHG200	Graphite V-Groove, $\varnothing 150 \mu\text{m}$ - $\varnothing 200 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG250	Graphite V-Groove, $\varnothing 200 \mu\text{m}$ - $\varnothing 250 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG300	Graphite V-Groove, $\varnothing 250 \mu\text{m}$ - $\varnothing 300 \mu\text{m}$ , 0.313" Length	\$143.92	Lead Time
VHG350	Graphite V-Groove, $\varnothing 300 \mu\text{m}$ - $\varnothing 350 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG400	Graphite V-Groove, $\varnothing 350 \mu\text{m}$ - $\varnothing 400 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG450	Graphite V-Groove, $\varnothing 400 \mu\text{m}$ - $\varnothing 450 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG500	Graphite V-Groove, $\varnothing 450 \mu\text{m}$ - $\varnothing 500 \mu\text{m}$ , 0.313" Length	\$143.92	Today
VHG550	Graphite V-Groove, $\varnothing 500 \mu\text{m}$ - $\varnothing 550 \mu\text{m}$ , 0.313" Length	\$143.92	Today

## Digital Microscope Kits - Optional

- ▶ LDCCK Microscope and Tablet Mount Kit:
  - ▶ Digital Microscope for Imaging the Fiber, Cleave Blade, and Micrometer Position
  - ▶ Swing Arm Mount for Quick and Easy Positioning of Microscope
  - ▶ Tablet Mount Positions Controls Above and Behind the Cleaver
  - ▶ Integrated USB Hub Simultaneously Connects Microscope and Cleaver to Tablet
  - ▶ Compatible with LDC401 and LDC401A Fiber Cleavers
- ▶ LDCCK Microscope Kit:
  - ▶ Includes Digital Microscope and Swing Arm
  - ▶ Requires PC or Tablet (Not Included) to View Image
  - ▶ Compatible with LDC401 and LDC401A Fiber Cleavers as well as Previous-Generation LDC400 and LDC400A Fiber Cleavers

Digital Microscope Specifications	
Magnification	20X to 220X
Resolution	Native: 1600 x 1200 Pixels With Interpolation: 2560 x 2048 Pixels
Color	24 bit RGB
Focus Range	10 mm to Infinite
Flicker Frequency	50 Hz / 60 Hz
Shutter Speed	1 ms to 1 s
Frame Rate	$\leq 30$ fps @ 600 lumens
Still Image Format	JPG and BMP
Video Format	AVI
White Balance	Auto
Exposure	Auto
Light Source	8 White Light LEDs, 40 lux
Interface	USB 2.0
Power Supply	5 VDC from USB Port
Operating System	Mac®, Windows® 98SE / ME / 2000 / XP / Vista / 7 / 8 / 10
Dimensions	$\varnothing 33$ mm x 112 mm

These optional kits feature a digital microscope on a swing arm that attaches to the side of our LDC Series Fiber Cleavers. The microscope can image the fiber, cleave blade, and micrometer backstop at up to 220X magnification, enabling more effective use of the cleaver. The magnification of the microscope can be adjusted using the silver wheel on the side, and the focus can be adjusted by sliding the microscope in its holder. The microscope also incorporates eight white light LEDs for illumination of the subject. The brightness of these LEDs may be adjusted using the narrow black



Click to Enlarge  
LDCCK Digital



Microscope Kit

wheel near the top of the microscope. A button on the side captures a still image when pressed.

The LDCCM kit includes the digital microscope, swing arm, and a tablet mount for holding the tablet included with our LDC401 and LDC401A cleavers above the system, minimizing its footprint. The tablet mount incorporates a USB hub that enables the tablet included with the LDC401 and LDC401A cleavers to interface with the cleaver and the microscope simultaneously. The microscope can then be controlled using the software that comes pre-installed on the LDC401 or LDC401A tablet. The microscope cannot be controlled using the VYT300C handset controller.

The LDCCK kit includes only the digital microscope and swing arm for users that do not wish to mount a tablet above the workstation. To use the LDC401 or LDC401A Cleaver's tablet to control the cleaver and view the microscope image simultaneously, a separate USB hub (not included) is necessary. Alternatively, each kit includes a CD with software that allows the microscope to be operated via a tablet or PC supplied by the user. The LDCCK Kit is also compatible with our previous-generation LDC400 and LDC400A Fiber Cleavers and can be operated using the controller included with those systems. The microscope cannot be controlled using the VYT300C handset controller.

Part Number	Description	Price	Availability
LDCCM	Digital Microscope and Tablet Mount for LDC401 and LDC401A Fiber Cleavers	\$1,283.69	Lead Time
LDCCK	Digital Microscope for LDC Series Fiber Cleavers	\$861.45	Lead Time

## Replacement Diamond Cleave Blade

- ▶ Replacement Blade for Our Fiber Cleaving Systems (See List to the Right)
- ▶ 0.08" (2.0 mm) Long Diamond Blade
- ▶ User Installable

### Compatible Systems

- FPC200 Fiber Preparation Station
- CAC400 and CAC400A Fiber Cleavers
- LDC401 and LDC401A Fiber Cleavers
- LDC450B Portable Fiber Cleaver
- GPX3800 and GPX3850 Automated Glass Processors with Cleavers
- FFS2000 and FFS2000PT Fiber Preparation and Splicing Workstations
- FFS2000PM and FFS2000WS Fiber Preparation, Splicing, and Proof Testing Workstations
- Former Generation LDC-200 Fiber Cleaver



Click to Enlarge

The blade is shipped in a protective covering.

The ACL83 Diamond Cleave Blade is a replacement blade for the Vytran fiber processing systems listed to the right. Each system is shipped with a blade included.

When used with proper cleave parameters, a single location on the blade can provide up to 5,000 cleaves (dependent on the cladding properties of the fiber being cleaved). The blade can be positioned approximately 10 times before replacement (assuming proper cleave parameters and usage that does not cause unexpected damage to the blade). Blade replacement instructions for each system are provided in the user manuals.

Note: Severe damage to the blade can occur if conditions cause high stress perpendicular to the edge of the blade or if incorrect parameters are used to cleave the fiber.

Part Number	Description	Price	Availability
ACL83	Replacement Diamond Cleave Blade	\$662.26	Today