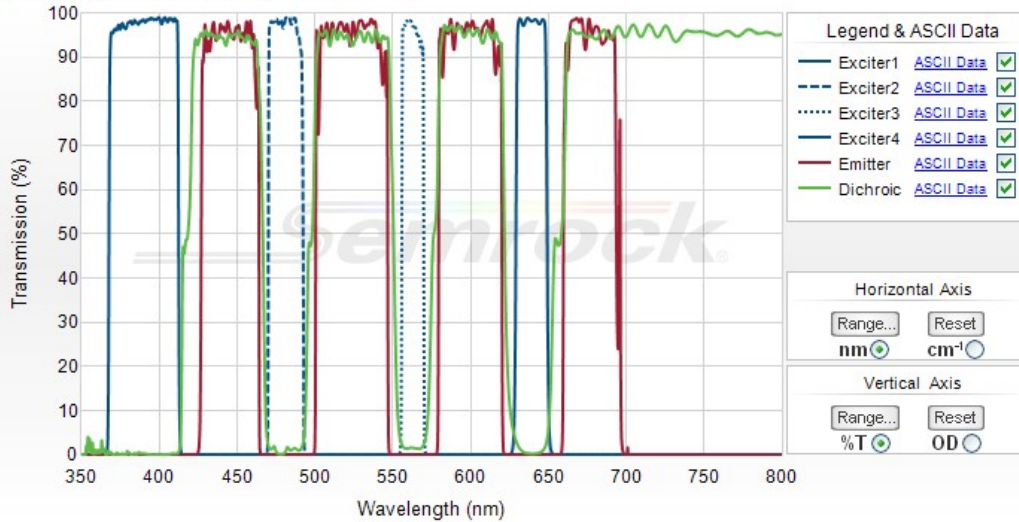


**BrightLine® Pinkel 1λ P-V RWE super-resolution laser filter set, optimized for 405, 488, 561, & 635 nm laser sources**

Part Number: LF405/488/561/635-4X-B-000



**Semrock, Inc**  
3625 Buffalo Road, Suite 6  
Rochester, New York 14624

Main Phone: +1 585.594.7050 (worldwide)  
Toll Free Phone: 866.736.7625 (866-SEMROCK)  
(within US and Canada)

**BrightLine® Pinkel 1λ P-V RWE super-resolution laser filter set, optimized for 405, 488, 561, & 635 nm laser sources**

This "Pinkel" multiband set is optimized for laser excitation over four bands - utilizing a 375 or 405 nm laser source for DAPI, a 473 or 488 nm laser source for GFP or FITC, a 559, 561.4 or 568.2 nm laser source for mCherry, and a 632.8, 635, or 647.1 nm laser source for Cy5. This set provides high brightness, extremely low crosstalk, and superb signal-to-noise ratio. The dichroic offers industry-leading 1λ P-V RWE for minimal focus shift and aberrations of the laser beam spot up to 10 mm diameter to enable popular imaging and Super-Resolution techniques including TIRF, PALM, STORM, and Structured-Illumination.

**Loose and cube mounted filter sets are certified to deliver dichroic flatness <= 1λ P-V RWE @ 632.8 nm.**

**Looking for this filter set in one of the following cubes: NQF, LDMK or LDMP?**

Our previous version is still available for those cube configurations [LF405/488/561/635-4X-A](#)

**Individual filters and filter sets (no cube):**

These filters sets contain individual filters. For filter sets already mounted in a holder/cube, scroll down to see complete mounted sets with cubes.

Part Number	Price <sup>1</sup>	Stock Status																												
<input checked="" type="checkbox"/> LF405/488/561/635-4X-B-000 (Standard size set, fits most microscopes)	\$2,185	Contact Us																												
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<input checked="" type="checkbox"/> LF405/488/561/635-4X-B-L01 (Leica 'Large' set)	\$2,185	Contact Us																												
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1) US domestic pricing only. If you are ordering from outside the US, please contact your nearest regional distributor for the correct list price.

## Complete filter sets mounted in microscope holders/cubes:

These sets are delivered already mounted in microscope filter holders, often called 'cubes', ready to be dropped into your microscope.

### Nikon TE 2000 for microscopes: TE 2000, 50i, 55i, 80i, 90i, Eclipse Ti, Ni, and Ci series, and any using the Epi-fluor Illuminator

LF405/488/561/635-4X-B-NTE (set mounted in cube) \$2,705 [Contact Us](#)

Filter Role	Filter Size	Part Number	Price <sup>1</sup>
Single Band Exciter	25 mm x 5.0 mm	<a href="#">FF01-390/40-25</a>	\$305
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Quad Band Emitter	25 mm x 3.5 mm	<a href="#">FF01-446/523/600/677-25</a>	\$495
Quad Band Dichroic	25.2 mm x 35.6 mm x 1.1 mm	<a href="#">Di03-R405/488/561/635-t1-25x36</a>	\$595
TE 2000 cube		<a href="#">NTE</a>	\$395

### Olympus U-MF2 for microscopes: AX70, BX, BX41, BX50, BX51, BX60, BX61, BX50/51WI, BX60/61WI, IX50, IX51, IX70, IX71, IX81

LF405/488/561/635-4X-B-OMF (set mounted in cube) \$2,745 [Contact Us](#)

Filter Role	Filter Size	Part Number	Price <sup>1</sup>
Single Band Exciter	25 mm x 5.0 mm	<a href="#">FF01-390/40-25</a>	\$305
Single Band Exciter	25 mm x 5.0 mm	<a href="#">FF02-482/18-25</a>	\$305
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Quad Band Emitter	25 mm x 3.5 mm	<a href="#">FF01-446/523/600/677-25</a>	\$495
Quad Band Dichroic	25.2 mm x 35.6 mm x 1.1 mm	<a href="#">Di03-R405/488/561/635-t1-25x36</a>	\$595
U-MF2 cube		<a href="#">OMF</a>	\$435

### Olympus U-FF for microscopes: BX53, BX63

LF405/488/561/635-4X-B-OFF (set mounted in cube) \$2,745 [Contact Us](#)

Filter Role	Filter Size	Part Number	Price <sup>1</sup>
Single Band Exciter	25 mm x 5.0 mm	<a href="#">FF01-390/40-25</a>	\$305
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Quad Band Dichroic	25.2 mm x 35.6 mm x 1.1 mm	<a href="#">Di03-R405/488/561/635-t1-25x36</a>	\$595
U-FF cube		<a href="#">OFF</a>	\$435

### Zeiss FL Cube EC P+C for microscopes: Axio Imager, AxioStar Plus, Axioskop 40, Axioskop 2 (post-2001), AxioPlan 2i, AxioPlan 2ie, Axiovert 200, Axiovert 40, Axio Observer, Axio Examiner and Axio Scope A1

LF405/488/561/635-4X-B-ZHE (set mounted in cube) \$2,585 [Contact Us](#)

Filter Role	Filter Size	Part Number	Price <sup>1</sup>
Single Band Exciter	25 mm x 5.0 mm	<a href="#">FF01-390/40-25</a>	\$305
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Quad Band Dichroic	25.2 mm x 35.6 mm x 1.1 mm	<a href="#">Di03-R405/488/561/635-t1-25x36</a>	\$595
FL Cube EC P+C cube		<a href="#">ZHE</a>	\$275

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## Optical Specifications

Specification	Value
Blocking	BrightLine filters have blocking far exceeding OD 6 as needed to ensure a black background, even when using modern low-noise CCD cameras. The blocking is optimized for microscopy applications using our exclusive SpecMaker™ fluorescence filter design.

## General Filter Specifications

Specification	Value
Microscope Compatibility	BrightLine filters are available to fit Leica, Nikon, Olympus, Zeiss, and Apero microscopes.
Optical Damage Rating	Testing has proven to show no signs of degradation when exposed to at least 6.0 W of power from an unfiltered xenon arc lamp over a 25 mm diameter (corresponding to 1.2 W/cm <sup>2</sup> ) for over 500 hours.

### Physical Filter Specifications

Specification	Value
Scratch-Dig	60-40
Exciter/Emitter Orientation	Arrow on ring indicates preferred direction of propagation of light.
Dichroic Orientation	"Reflective coating side" should face toward light source and sample.
Flatness	Loose and cube mounted filter sets deliver certified dichroic flatness $\leq 1\lambda$ P-V RWE @ 632.8 nm

### Fluorophore Compatibility

★★★★ indicates this filter set was specifically optimized for this fluorophore.

★★★ indicates an excellent spectral match between fluorophore and filter set that should result in nearly ideal performance in most situations.

★★ indicates a good match between fluorophore and filter set, with actual performance dependent on other experimental conditions.

#### Blue

Fluorophore	Compatibility
1,8-ANS	★★
4-methylumbelliferone	★★
7-hydroxy-4-methylcoumarin	★★★
Alexa Fluor® 405	★★
AMCA (Aminomethylcoumarin)	★★★
ATTO 390	★★
BD Horizon V450	★★★
<b>BFP (EBFP)</b>	★★★★
Calcofluor White	★★
Cascade Blue™	★★
CellTrace calcein violet	★★★
<b>DAPI</b>	★★★★
DiFMU-pH 9.0	★★
DY-415	★★
DyLight 405	★★★
ER-Tracker™ Blue-White DPX	★★
HiLyte Fluor™ 405	★★★
Hoechst 33258	★★
LIVE-DEAD Fixable Violet Dead Cell Stain	★★★
LysoSensor Blue	★★★
LysoTracker Blue	★★
Marina Blue	★★★
Pacific Blue™	★★★
sgBFP™	★★★
Sirius	★★★
SpectrumBlue	★★★
TagBFP	★★★
Vybrant DyeCycle Violet	★★★

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#### Green

Fluorophore	Compatibility
5-carboxy-2,7-dichlorofluorescein	★★★
5-FAM (5-carboxyfluorescein)	★★★
Acridine Orange (+DNA)	★★★
Alexa Fluor® 430	★★
Alexa Fluor® 488	★★★
Alexa Fluor® 500	★★★

AmCyan1	☆☆☆
ATTO 488	☆☆☆
ATTO 495	☆☆☆
BCECF (pH 5.5)	☆☆☆
BCECF (pH 9.0)	☆☆☆
BODIPY FL	☆☆☆
BODIPY FL-MeOH	☆☆☆
Calcein	☆☆☆
Calcium Green-1	☆☆
CFP2	☆☆☆
Cy2™	☆☆☆
CyQUANT GR-DNA	☆☆☆
DAF-FM-NO	☆☆☆
Dendra2 (Green)	☆☆☆
DiO	☆☆☆
Dronpa	☆☆☆
DY-505-Phalloidin	☆☆☆
ecliptic pHLuorin pH5.5	☆☆☆
Emerald	☆☆☆
evoglow-Bs1	☆☆
<b>FITC (Fluorescein)</b>	☆☆☆☆☆
FIAsH-CCPFCC	☆☆
Fluo-3	☆☆
Fluo-4	☆☆☆
Fluorescein dextran	☆☆☆
Fluorescein-pH 8.0	☆☆☆
Fluoro-Emerald	☆☆☆
FluoSpheres Yellow-Green fluorescent microspheres	☆☆☆
FM 1-43	☆☆
<b>GFP (EGFP)</b>	☆☆☆☆☆
Green 496	☆☆☆
Green 500	☆☆☆
HCS LipidTOX Green neutral lipid stain	☆☆☆
HCS LipidTOX Green phospholipidosis	☆☆☆
HiLyte Fluor™ 488	☆☆☆
LIVE-DEAD Fixable Green Dead Cell Stain	☆☆☆
LysoSensor Green	☆☆☆
LysoTracker Green	☆☆☆
LysoTracker Yellow HCK-123	☆☆
Magnesium Green	☆☆
mHoneyDew	☆☆
MitoTracker™ Green	☆☆☆
mWasabi	☆☆☆
NBD-X (MeOH)	☆☆☆
NeuroTrace 500/525 Green Fluorescent Nissl Stain	☆☆☆
Oregon Green™ 488	☆☆☆
Oregon Green™ 514	☆☆
PicoGreen	☆☆☆
PKH67	☆☆☆
Qdot® 525 Nanocrystals	☆☆
Qdot® 545 Nanocrystals	☆☆
ratiometric pHLuorin pH5	☆☆☆
Rhodamine 110	☆☆☆
Rhodamine 123	☆☆
Rhodamine Green	☆☆☆
Rhodol Green	☆☆☆
sgGFP™ (super glow GFP)	☆☆☆
Sodium Green	☆☆☆

SpectrumGreen	☆☆☆
SYBR Gold nucleic acid gel stain-DNA	☆☆☆
SYBR Green I nucleic acid gel stain-DNA	☆☆☆
SYBR Safe DNA gel stain-DNA	☆☆
SYTO 11	☆☆
SYTO 13	☆☆☆
SYTO 16	☆☆☆
SYTO 9	☆☆☆
SYTO RNASelect geen fluorescent cell stain	☆☆☆
SYTOX Green-DNA	☆☆☆
TO-PRO-1	☆☆
TOTO-1	☆☆
TurboGFP	☆☆☆
Vybrant DyeCycle Green	☆☆☆
wtGFP (wild type GFP, non-UV excitation)	☆☆☆
YO-PRO-1	☆☆☆
YOYO-1	☆☆☆

☆☆☆☆ indicates this filter set was specifically optimized for this fluorophore.

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## Orange

Fluorophore	Compatibility
2-dodecylresorufin-lipid	☆☆☆
5-ROX (carboxy-X-rhodamine)	☆☆☆
5-TAMRA (5-carboxytetramethylrhodamine, pH 7.0)	☆☆☆
Alexa Fluor® 546	☆☆
Alexa Fluor® 555	☆☆
Alexa Fluor® 568	☆☆☆
Alexa Fluor® 594	☆☆
Amplex UltraRed peroxidation product-pH 7.5	☆☆☆
AsRed 2	☆☆☆
ATTO 550	☆☆☆
ATTO 565	☆☆☆
BOBO™-3	☆☆☆
BODIPY TMR-X	☆☆
BODIPY TR-X (MeOH)	☆☆
BODIPY TR-X phalloidin	☆☆
Calcium Crimson	☆☆
Calcium Orange	☆☆
CellTracker Red CMTPX	☆☆☆
Cy3.5™	☆☆☆
Cy3™	☆☆
Dendra2 (Red)	☆☆
Dil	☆☆
DsRed	☆☆☆
DsRed-Express	☆☆☆
dTomato	☆☆☆
DY-590	☆☆☆
DyLight 594	☆☆
Ethidium bromide	☆☆
Ethidium homodimer	☆☆☆
FluoSpheres Red fluorescent microspheres	☆☆☆
HCS LipidTOX Red neutral lipid stain	☆☆☆
HCS LipidTOX Red phospholipidosis	☆☆☆
HiLyte Fluor™ 594	☆☆
Hypericin	☆☆
KFP-Red	☆☆☆

LOLO-1	☆☆☆
LysoTracker Red	☆☆☆
Magnesium Orange	☆☆
mApple	☆☆☆
<b>mCherry</b>	☆☆☆☆
Merocyanine 540	☆☆☆
MitoTracker™ Orange	☆☆
MitoTracker™ Red	☆☆☆
mKate2	☆☆
mOrange2	☆☆
mRFP	☆☆☆
<b>mRFP1</b>	☆☆☆☆
mRuby	☆☆☆
mStrawberry	☆☆☆
mTangerine	☆☆☆
Nile red-phospholipid	☆☆
Orange 552	☆☆
pHrodo™, succinimidyl ester	☆☆☆
Propidium Iodide (PI)	☆☆☆
Pro-Q Diamond	☆☆☆
Qdot® 585 Nanocrystals	☆☆☆
Qdot® 605 Nanocrystals	☆☆☆
ReAsH-CCPGCC	☆☆☆
Red 580	☆☆☆
Resorufin	☆☆☆
Rhod-2	☆☆☆
Rhodamine phalloidin	☆☆
Rhodamine Red-X	☆☆☆
R-phycoerythrin	☆☆☆
SNARF (carboxy) 514 Excitation pH 9	☆☆
SNARF-1 488nm (ph 6.0)	☆☆☆
SNARF-1 488nm (ph 9.0)	☆☆
SNARF-1 514nm (ph 6.0)	☆☆☆
SNARF-1 514nm (ph 9.0)	☆☆
SpectrumOrange	☆☆☆
Sulforhodamine 101-EtOH	☆☆☆
SYTOX Orange	☆☆
Tetramethylrhodamine dextran	☆☆☆
Texas Red dextran	☆☆
Texas Red DHPE	☆☆☆
TRITC (Tetramethylrhodamine)	☆☆☆
TurboRFP	☆☆
X-Rhod-1 Indicator	☆☆☆

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Red	
Fluorophore	Compatibility
5-carboxynaphthofluorescein (pH 10)	☆☆
Alexa Fluor® 633	☆☆
Alexa Fluor® 635	☆☆
Alexa Fluor® 647	☆☆☆☆
Alexa Fluor® 660	☆☆☆☆
APC	☆☆☆☆
APC (Allophycocyanin)	☆☆☆☆
ATTO 633	☆☆☆☆
ATTO 635	☆☆☆☆

ATTO 647	☆☆☆
ATTO 647N	☆☆☆
ATTO 655	☆☆☆
BODIPY 650/665-X	☆☆☆
Carboxynaphthofluorescein	☆☆
Cy5.5™	☆☆
Cy5™	☆☆☆☆
DDAO	☆☆☆
DiD (DiIc18(5)) - Lipophilic Tracer	☆☆☆
DY-630	☆☆☆
DyLight 633	☆☆
DyLight 649	☆☆☆
FluoSpheres Crimson fluorescent microspheres	☆☆
FluoSpheres Dark Red fluorescent microspheres	☆☆☆
HCS CellMask Red cytoplasmic	☆☆
HCS LipidTOX Deep Red neutral lipid stain	☆☆
HiLyte Fluor™ 647	☆☆☆
LIVE-DEAD Fixable Far Red Dead Cell Stain	☆☆☆
MitoTracker™ Deep Red	☆☆☆
Nile blue-EtOH	☆☆☆
Qdot® 705 Nanocrystals	☆☆
Red 650	☆☆☆
SpectrumFRed (Far Red)	☆☆☆
SYTO 59	☆☆
SYTO 60	☆☆☆
SYTO 61	☆☆
SYTOX Red-DNA	☆☆☆
TO-PRO-3	☆☆☆
TOTO-3	☆☆☆

## Technical Information

Topic	Description
<a href="#">Laser-based Instrumentation</a>	An review of common of laser-based instrumentation, including solutions from Semrock and additional learning resources.
<a href="#">Laser Scanning/Spinning Disk Confocal Microscopy</a>	An overview of confocal microscopy techniques and applications, including solutions from Semrock and additional learning resources.
<a href="#">TIRF (Total Internal Reflection Fluorescence)</a>	An overview of TIRF microscopy, including solutions from Semrock and additional learning resources.
<a href="#">High Performance Microscopy</a>	An overview of high performance microscopy, including solutions from Semrock and additional learning resources.
<a href="#">Spectral Modeling in Fluorescence Microscopy</a>	Discusses various sources of noise in fluorescence microscopy and how to maximize signal-to-noise ratios using software, sample preparation and optical filter selection
<a href="#">Super-resolution Microscopy</a>	Discusses advancements in fluorescence microscopy techniques that allow users to break the defraction limit and visualize resolution similar to that of an electron microscope
<a href="#">Optical Filters for Laser-based Fluorescence Microscopes</a>	Analysis of additional considerations that laser excitation imposes on traditional fluorescence microscopy filter selection with a focus on multiple-laser systems.
<a href="#">Perfecting TIRF Optics</a>	Prashant Prabhat, PhD, and Turan Erdogan, PhD, Semrock Inc., BioOptics World, Jan/Feb 2009 Discusses additional considerations that laser excitation imposes on traditional fluorescence microscopy filter selection
<a href="#">New Optical Filters Improve High-Speed Multicolor Fluorescence Imaging</a>	Turan Erdogan, PhD, Semrock Inc., BioPhotonics, March 2006 Compares benefits and drawbacks of full multiband, pinkel and sedat filter sets for high-speed multicolor fluorescence imaging
<a href="#">Fluorescence Imaging: Optical filters optimize laser-based fluorescence imaging systems</a>	Prashant Prabhat, PhD, and Turan Erdogan, PhD, Semrock Inc., Laser Focus World, January 2010 Discusses additional considerations that laser excitation imposes on traditional fluorescence microscopy filter selection
<a href="#">Bringing Super-resolution to Fluorescence Microscopy</a>	Prashant Prabhat, PhD, and Turan Erdogan, PhD, Semrock Inc., BioPhotonics, May/June 2010 Advances in fluorescence microscopy techniques allow users to break the defraction limit and visualize resolution similar to that of an electron microscope
<a href="#">Optical Filters for Laser-based Fluorescence Microscopes</a>	Discusses additional considerations that laser excitation imposes on traditional fluorescence microscopy filter selection
<a href="#">Multiband Filter Set Terminology</a>	Compares benefits and drawbacks of full multiband, pinkel and sedat filter sets
<a href="#">Orientation of Filters in a Microscope</a>	A guide to properly orienting Semrock filters based on the filter markings.
<a href="#">Introduction to Fluorescence Filters</a>	Shows how optical filters are used in a traditional fluorescence microscope and describes important factors to consider when choosing optical filters.
<a href="#">Flatness of Dichroic Beamsplitters</a>	Describes the impact of non-flat dichroic beamsplitters on microscope image fidelity

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[Filter Reliability](#)

Compares the performance and reliability of hard coated filters to traditional soft-coated filters and provides information about the testing standards for Semrock filters

[Cube Assembly Instructions](#)

PDF and video instruction for installing filters into popular filter cubes

[Cleaning Optical Filters](#)

Instructions for cleaning hard coated optical filters