



# Leica DFC345 FX

High Resolution, High Sensitivity Monochrome Camera  
for Fluorescence Applications

Living up to Life

**Leica**  
MICROSYSTEMS

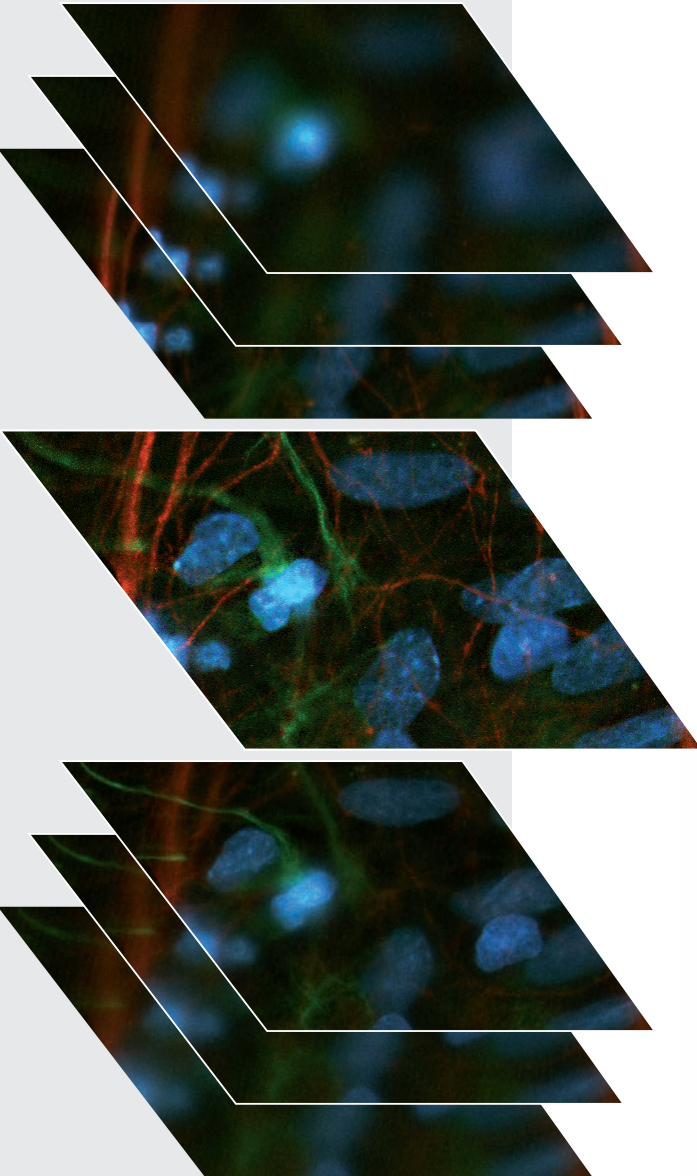
# Detailed Documentation of Fluorescence Specimens at High Speed

Low light fluorescent documentation creates special demands for digital cameras. To address these applications, Leica Microsystems has completed the portfolio of powerful digital cameras with the new high-resolution, high-sensitivity Leica DFC345 FX. It is ideally suited for detailed documentation of applications where only limited light is available.

## Brilliant and detailed fluorescence imaging

The 2-megapixel CCD sensor with a pixel size of 4.4  $\mu\text{m}$  ensures that each image reveals extraordinary details. High resolution combined with the high dynamic range offered by the Leica DFC345 FX allows dark (non-labeled) and bright (fluorescent-labeled) specimens to be monitored within the same image with the finest documentation of details.

Under difficult conditions with minimum light intensity, photo-electric elements must be cooled to produce noise-free images. Leica's method of active cooling via a Peltier element effectively reduces background noise in the image. The combination of low background and high quantum efficiency makes this camera ideally suited for high contrast documentation of even weak fluorescence signals.



Cultured cortical neurons of the rat (DAPI, Cy2, Cy5), FAN GmbH, Magdeburg. Z-stack acquired with Leica AF6000.

The automated research microscope Leica DM6000 B with the digital camera Leica DFC345 FX.



### Prepared for demanding multidimensional image acquisition

The new Leica DFC345 FX images fine structures and delivers top picture quality for practically all fluorescence applications. With the “overlapping mode” (temporal overlap of exposure time and readout time), the camera is especially well suited for multidimensional image acquisition applications with high-speed requirements. Faster frame rates and further enhancement of signal to noise ratio can be achieved by various binning modes and flexible readout of sensor sub-regions.

The camera also features a trigger capability as prerequisite for finely tuned operation of peripheral devices, such as external excitation light sources, shutters, and motorized stages. The complete system, including the microscope, light source, and camera operates as a harmonized system for easy, high-quality multidimensional image acquisition.

### Convenient handling

The Leica DFC345 FX makes imaging easy. The camera is equipped with a C-mount coupling for connection to a wide range of microscopes. A FireWire b interface (IEEE1394b) is available for simple, reliable data transmission to the computer. A separate power supply is not necessary. The fast data transfer at up to 800 Megabits/s and the high frame rates allow the smooth movement of the specimen image in x, y, and z direction during live display. The compact camera housing with effective cooling does not need a fan, which ensures vibration free imaging.

### Convincing software solutions for a broad range of applications

Synergy based on perfect integration: The Leica DFC345 FX works seamlessly with Leica Microsystems’ three life science research software platforms to support an unlimited number of applications:

- Leica Application Suite (LAS), the highly modular software for basic fluorescence image acquisition and data storage
- Easy-to-use LAS AF designed for Advanced Fluorescence applications
- Leica MM AF powered by MetaMorph® for sophisticated analysis applications



### Feature highlights for fluorescence documentation

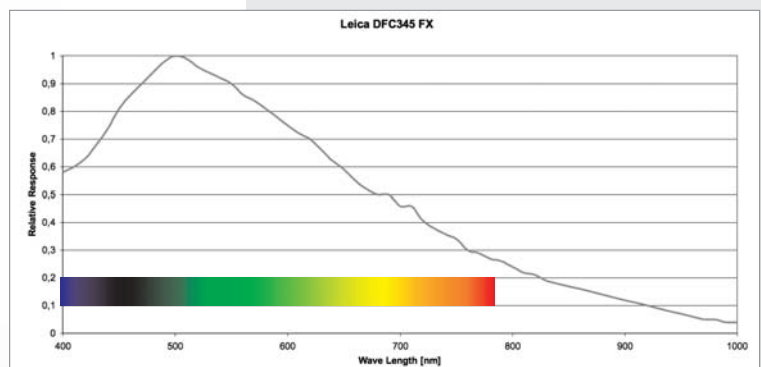
- The 2-Mpixel CCD provides brilliant images, 1600×1200 resolution resolves the finest details
- 8 or 12 bit digitization allows users to select the amount of detail required for their images
- Features high linearity over the whole light intensity range
- Peltier cooling effectively reduces background noise
- Integrated micro lenses increase sensitivity
- 40 MHz pixel clock provides fast image readout, 20 MHz pixel clock offers reduced readout noise for high-quality images
- Freely definable partial scan (ROI)
- Overlapping mode with overlapping exposure and read out time for high speed acquisition
- Gain control of 1x–10x facilitates live previews of low light specimens
- Flash & Trigger connector enables precise integration with shutters, filter wheels, etc.

### Equipment components:

Order numbers

11547003 Leica DFC345 FX camera kit

11 600243 optional trigger cable for Leica AF6500–AF7000 software



Relative quantum efficiency of the Leica DFC345 FX.

# Leica DFC345 FX Technical Data

Camera type	Digital monochrome, high-sensitivity cooled camera for fluorescence microscopy		
Housing	Aluminum, Size (L × W × H) 132 mm × 74 mm × 71 mm, Weight 495 g		
<b>Sensor</b>			
CCD sensor	Sony ICX274, Super HAD CCD technology; 1/1.8" interline transfer progressive scan		
Number of pixels	1600 × 1200		
Pixel size	4.4 μm × 4.4 μm		
Sensitive surface	7.04 mm × 5.28 mm		
Full well capacity	15 000 electrons		
Exposure time	4 μseconds – 120 seconds*		
Cooling	Active (Peltier cooling)		
Readout noise	σ < 4 LSB (12-bit) typical		
Dark current	< 0.75 electrons/pixel/second		
Dynamic range	1000:1; > 60 dB		
<b>Image formats</b>	<b>Pixels</b>	<b>Pixel Clock</b>	<b>fps*</b>
Full frame Fast	1600 × 1200	40 MHz	16
Full frame HQ	1600 × 1200	20 MHz	8
Binning 2 × 2	800 × 600	40 MHz	29
	800 × 600	20 MHz	15
Binning 3 × 3	532 × 400	40 MHz	38
	532 × 400	20 MHz	20
Binning 4 × 4	400 × 300	40 MHz	53
	400 × 300	20 MHz	27
Pixel clocking rate	Fast (40 MHz) or High Quality (20 MHz) as indicated above		
Digitization	8-bit/12-bit		
Analog gain	1× – 10×		
<b>Software</b>			
Supported operating systems	Windows XP, Vista (32 and 64 bit)		
Software PC	DFC Twain, Leica LAS; Leica LAS AF, Leica MM AF powered by MetaMorph®		
<b>Interfaces</b>			
Optical	C-mount		
Recommended video adapter	0.55×		
Data	IEEE 1394b FireWire 9-pin single cable		
Power supply	12 V via computer		
Power consumption	6 W (with cooling)		
<b>Miscellaneous</b>			
Minimum computer configuration	PC Pentium 4, 1 GB RAM, 24 bit true color, FireWire b onboard or 1 free PCI slot		
Operating temperature range	+5 to +35°C		
Air humidity	max 80%, non condensing**		

\* : depends on software/ hardware performance

\*\* : do not detach the camera from the microscope in a cooled status.

Illustrations, descriptions and technical data are not binding and may be changed without notice.