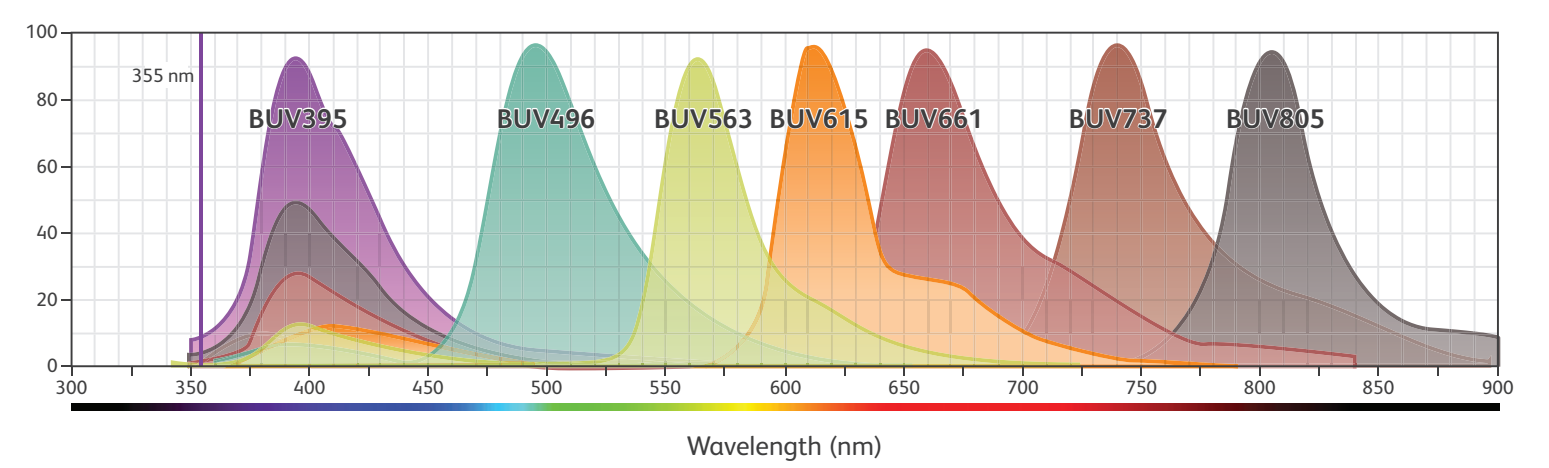


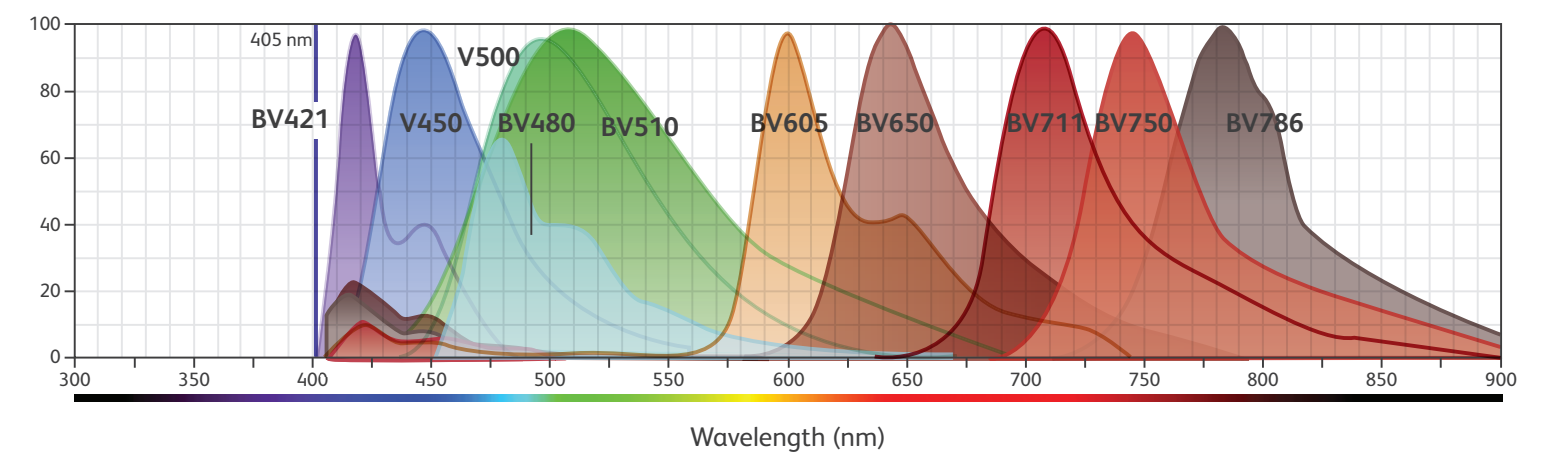
# BD Life Sciences—Biosciences Fluorochrome/Laser Reference Poster

Experience the full potential of multicolor flow cytometry with BD Life Sciences flow cytometry instruments, reagents and services. Visit our website for tools and information related to multicolor panel design including the interactive Fluorescence Spectrum Viewer, Multicolor Antibody Reagents Catalog, Human and Mouse Panels and more.

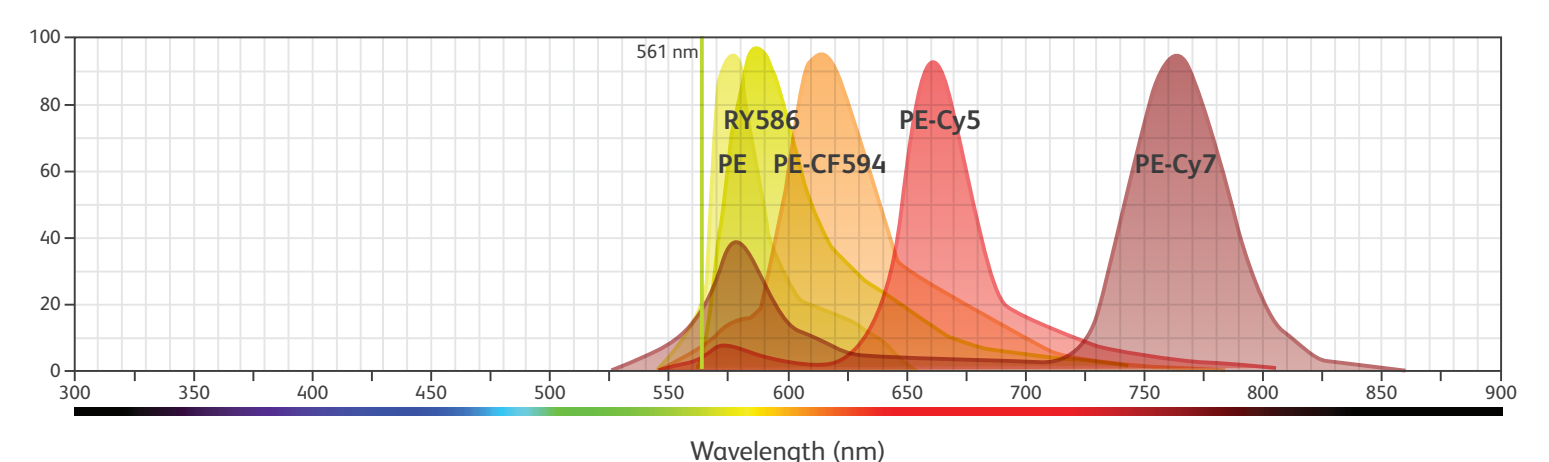
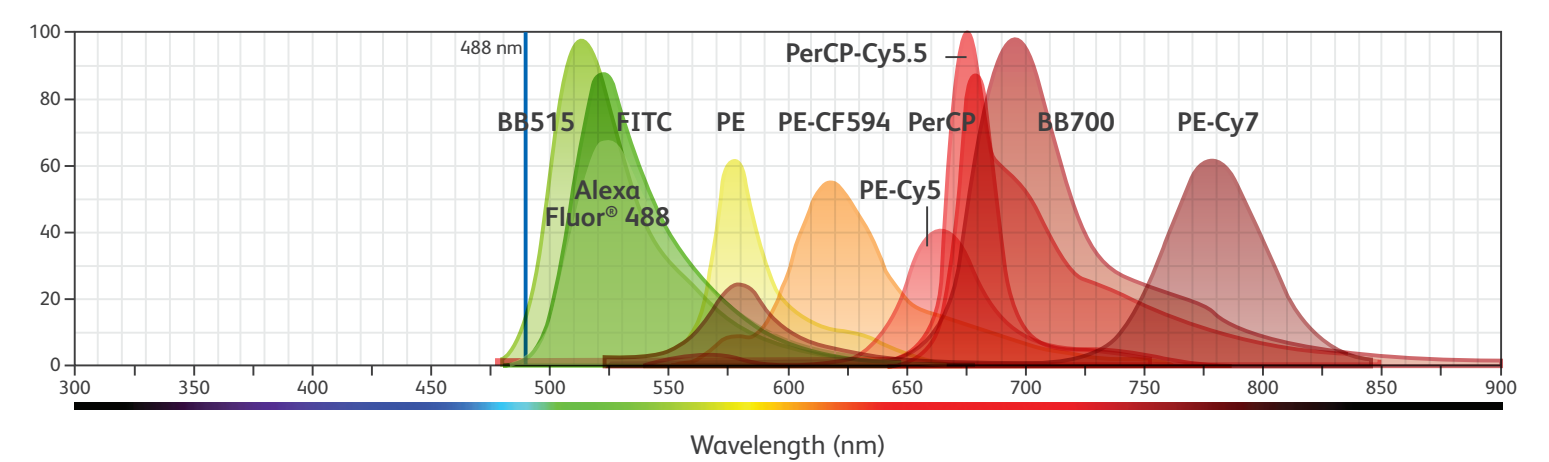
Analyzers	Sorters	Excitation Laser Line	Filter	Relative Brightness	Ultraviolet Laser (355 nm)
					Filter
BD Accuri <sup>™</sup> C6 Plus BD FACSCelebris <sup>™</sup> BD LSRIFortessa <sup>™</sup> Product Family <sup>*</sup> BD FACSymphony <sup>™</sup> Product Family <sup>*</sup> BD FACSAria <sup>™</sup> Product Family <sup>*</sup> BD FACSMelody <sup>™</sup> BD FACSymphony <sup>™</sup> S6 <sup>*</sup>		355 nm 349 nm	379/28	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 395 (BUV395)</b> (Ex <sub>max</sub> 348 nm/Em <sub>max</sub> 395 nm) is a polymer-based dye with an emission max at 395 nm. BUV395 is designed for instruments equipped with a 355 nm UV laser and a 379/28 filter. This dye is optimal for multicolor flow cytometry because it has minimal spillover into other detectors. BUV395 has been exclusively developed by BD Life Sciences.
		355 nm 349 nm	515/30	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 496 (BUV496)</b> (Ex <sub>max</sub> 351 nm/Em <sub>max</sub> 491 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BUV395 and an acceptor dye with an emission max at 491 nm. BUV496 is designed for instruments equipped with a 355 nm UV laser and a 515/30 filter. BUV496 has been exclusively developed by BD Life Sciences.
		355 nm 349 nm	585/15	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 563 (BUV563)</b> (Ex <sub>max</sub> 351 nm/Em <sub>max</sub> 560 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BUV395 and an acceptor dye with an emission max at 560 nm. BUV563 is designed for instruments equipped with a 355 nm UV laser and a 585/15 filter. Due to the excitation of the acceptor dye by other laser lines, there may be spillover into channels detecting PE (e.g., 575/26-nm filter) and PE-CF594 (e.g., 610/20-nm filter). BUV563 has been exclusively developed by BD Life Sciences.
		355 nm 349 nm	610/20	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 615 (BUV615)</b> (Ex <sub>max</sub> 350 nm/Em <sub>max</sub> 616 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BUV395 and an acceptor dye with an emission max at 616 nm. BUV615 is designed for instruments equipped with a 355 nm UV laser and a 610/20 filter. Due to the excitation of the acceptor dye by the 561 nm (yellow-green) laser line, there may be significant spillover into the PE-CF594 detector from the yellow-green laser. BUV615 has been exclusively developed by BD Life Sciences.
		355 nm 349 nm	670/25	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 661 (BUV661)</b> (Ex <sub>max</sub> 351 nm/Em <sub>max</sub> 657 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BUV395 and an acceptor dye with an emission max at 657 nm. BUV661 is designed for instruments equipped with a 355 nm UV laser and a 670/25 filter. Due to cross laser excitation of the acceptor dye, there may be significant spillover into the APC detector. BUV661 has been exclusively developed by BD Life Sciences.
		355 nm 349 nm	740/35	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 737 (BUV737)</b> (Ex <sub>max</sub> 350 nm/Em <sub>max</sub> 732 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BUV395 and an acceptor dye with an emission max at 732 nm. BUV732 is designed for instruments equipped with a 355 nm UV laser and a 740/35 filter. Due to cross laser excitation of the acceptor dye, there may be significant spillover into the Alexa Fluor <sup>™</sup> 700 detector (712/20). BUV737 has been exclusively developed by BD Life Sciences.
		355 nm 349 nm	820/60	Dim	<b>BD Horizon Brilliant<sup>™</sup> Ultraviolet 805 (BUV805)</b> (Ex <sub>max</sub> 351 nm/Em <sub>max</sub> 797 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BUV395 and an acceptor dye with an emission max at 797 nm. BUV805 is designed for instruments equipped with a 355 nm UV laser and a 820/60 filter. BUV805 has been exclusively developed by BD Life Sciences.



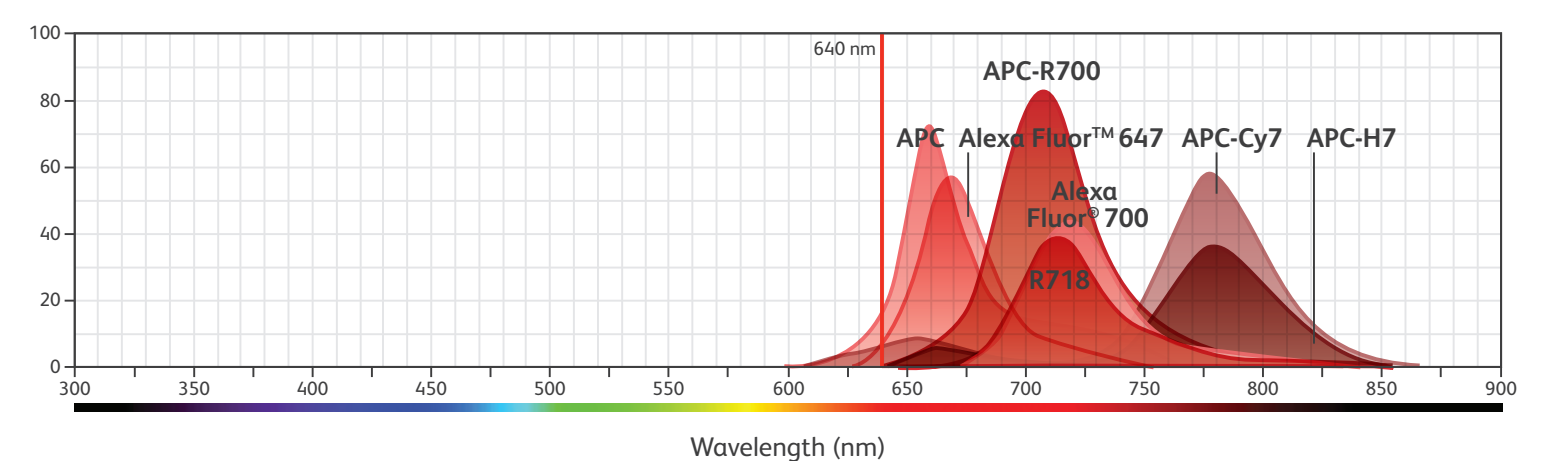
Analyzers	Sorters	Excitation Laser Line	Filter	Relative Brightness	Violet Laser (405 nm)
					Filter
BD Accuri <sup>™</sup> C6 Plus BD FACSCelebris <sup>™</sup> BD LSRIFortessa <sup>™</sup> Product Family <sup>*</sup> BD FACSymphony <sup>™</sup> Product Family <sup>*</sup> BD FACSAria <sup>™</sup> Product Family <sup>*</sup> BD FACSMelody <sup>™</sup> BD FACSymphony <sup>™</sup> S6 <sup>*</sup>		405 nm	450/40	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 421 (BV421)</b> (Ex <sub>max</sub> 407 nm/Em <sub>max</sub> 421 nm) is a polymer-based dye excited by the violet laser and is one of the brightest fluorochromes offered by BD Life Sciences. Conjugates are typically 10 times brighter than Pacific Blue <sup>™</sup> conjugates and are often as bright as or brighter than PE conjugates. Due to similar excitation and emission properties, BD Horizon <sup>™</sup> BV421 and BD Horizon <sup>™</sup> V450 cannot be used simultaneously.
		405 nm	450/40	Dim	<b>BD Horizon<sup>™</sup> Violet 450 (V450)</b> (Ex <sub>max</sub> 404 nm/Em <sub>max</sub> 448 nm) is a coumarin dye excited by the violet laser. Due to similar excitation and emission properties but different spillover characteristics, BD Horizon <sup>™</sup> BV421 and BD Horizon <sup>™</sup> V450 cannot be used simultaneously.
		405 nm	525/40	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 480 (BV480)</b> (Ex <sub>max</sub> 436 nm/Em <sub>max</sub> 478 nm) is a polymer-based dye that can be excited by the violet laser and detected in the BD Horizon <sup>™</sup> BV510 (525/40-nm) filter set. Due to its emission profile, BV480 has less spillover into the BV605, BV650 and BV711 channels and, in general, is brighter than BV510. Due to its excitation profile, BV480 will also have less cross-laser excitation with the UV laser, resulting in less spillover into UV channels compared to BV510. Due to similar excitation and emission properties, BV480, BV510 and V500 cannot be used simultaneously.
		405 nm	525/40	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 510 (BV510)</b> (Ex <sub>max</sub> 405 nm/Em <sub>max</sub> 510 nm) is a polymer-based dye that is brighter than BD Horizon <sup>™</sup> V500. Due to similar excitation and emission properties, BD Horizon <sup>™</sup> BV510 and BD Horizon <sup>™</sup> V500 cannot be used simultaneously.
		405 nm	525/50	Dim	<b>BD Horizon<sup>™</sup> Violet 500 (V500)</b> (Ex <sub>max</sub> 415 nm/Em <sub>max</sub> 500 nm) is a novel organic dye excited by the violet laser. This dye offers improved brightness over Pacific Orange <sup>™</sup> and reduced spillover into the FITC channel when compared to AmCyan. BD Horizon <sup>™</sup> V500 cannot be used simultaneously with BD Horizon <sup>™</sup> BV510 or Pacific Orange <sup>™</sup> .
		405 nm	610/20	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 605 (BV605)</b> (Ex <sub>max</sub> 407 nm/Em <sub>max</sub> 602 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BV421 and an acceptor dye with emission at 602 nm. These conjugates are very bright, exhibiting similar brightness to equivalent PE conjugates. Due to the excitation of the acceptor dye by the green (532-nm) and yellow-green (561-nm) lasers, there will be significant spillover of the BD Horizon <sup>™</sup> BV605 signal into the PE and BD Horizon <sup>™</sup> PE-CF594 detectors off the green or yellow-green lasers.
		405 nm	660/20	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 650 (BV650)</b> (Ex <sub>max</sub> 407 nm/Em <sub>max</sub> 650 nm) is a tandem fluorochrome of BD Horizon <sup>™</sup> BV421 and an acceptor dye with an emission max at 650 nm. Due to the excitation and emission characteristics of the acceptor dye, there will be spillover into the APC and Alexa Fluor <sup>™</sup> 700 detectors. BD Horizon <sup>™</sup> BV650 will have moderate spillover into the BD Horizon <sup>™</sup> BV711 detector.
		405 nm	710/50	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 711 (BV711)</b> (Ex <sub>max</sub> 407 nm/Em <sub>max</sub> 711 nm) is a tandem fluorochrome of BD Horizon <sup>™</sup> BV421 and an acceptor dye with an emission max at 711 nm. This dye offers a very bright choice for the violet laser. Due to the excitation and emission characteristics of the acceptor dye, there may be moderate spillover into the Alexa Fluor 700 and PerCP-Cy5.5 detectors. BD Horizon <sup>™</sup> BV711 will also have moderate spillover into the BD Horizon <sup>™</sup> BV786 detector.
		405 nm	750/30	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 750 (BV750)</b> (Ex <sub>max</sub> 405 nm/Em <sub>max</sub> 745 nm) is a tandem fluorochrome that combines BD Horizon <sup>™</sup> BV421 and an acceptor dye with an emission max at 745 nm. BV750 is designed for instruments equipped with a 405 nm violet laser and a 750/30 filter. Due to the excitation of the BV421 donor by the 355 nm (UV) laser line, there may be spillover into the BV737 detector off of the UV laser. Due to the close proximity of their emission spectra, there will be significant spillover from BV750 into BV786. BV750 has been exclusively developed by BD Life Sciences.
		405 nm	780/60	Dim	<b>BD Horizon Brilliant Violet<sup>™</sup> 786 (BV786)</b> (Ex <sub>max</sub> 407 nm/Em <sub>max</sub> 786 nm) is a tandem fluorochrome of BD Horizon <sup>™</sup> BV421 and an acceptor dye with an emission max at 786 nm. BD Horizon <sup>™</sup> BV786 offers a bright choice for the sixth detector off the violet laser.



Analyzers	Sorters	Excitation Laser Line	Filter	Relative Brightness	Blue Laser (488 nm) / Yellow-Green Laser (561 nm)	
					Filter	Relative Brightness
BD Accuri <sup>™</sup> C6 Plus BD FACSCelebris <sup>™</sup> BD LSRIFortessa <sup>™</sup> Product Family <sup>*</sup> BD FACSymphony <sup>™</sup> Product Family <sup>*</sup> BD FACSAria <sup>™</sup> Product Family <sup>*</sup> BD FACSMelody <sup>™</sup> BD FACSymphony <sup>™</sup> S6 <sup>*</sup>		488 nm	530/30	Dim	<b>BD Horizon Brilliant<sup>™</sup> Blue 515 (BB515)</b> (Ex <sub>max</sub> 490 nm/Em <sub>max</sub> 515 nm) is a dye that was exclusively developed by BD Life Sciences as an additional bright dye for the blue laser. This dye is significantly brighter than FITC and has less spillover into the PE channel. Due to similar excitation and emission properties, BD Horizon <sup>™</sup> BB515 and FITC/Alexa Fluor <sup>™</sup> 488 cannot be used simultaneously.	
		488 nm	530/30	Dim	<b>Alexa Fluor<sup>™</sup> 488 (A488)</b> (Ex <sub>max</sub> 495 nm/Em <sub>max</sub> 519 nm) conjugates are highly photostable and remain fluorescent over a broad pH range. Alexa Fluor <sup>™</sup> 488 tends to be brighter than FITC and more optimal for intracellular applications. Due to nearly identical excitation and emission properties, FITC and Alexa Fluor <sup>™</sup> 488 cannot be used simultaneously. Alexa Fluor <sup>™</sup> 488 exhibits extraordinary photostability, which makes it highly suitable for fluorescence microscopy.	
		488 nm	530/30	Dim	<b>FITC</b> (Ex <sub>max</sub> 494 nm/Em <sub>max</sub> 520 nm) Fluorescein isothiocyanate (FITC) is a fluorochrome with a molecular weight of 389 Da. FITC is sensitive to pH changes and photobleaching. Due to nearly identical excitation and emission properties, FITC and Alexa Fluor <sup>™</sup> 488 cannot be used simultaneously. FITC is relatively dim and should be reserved for highly expressed markers whenever possible.	
		488 nm 532 nm 561 nm	575/26	Dim	<b>PE</b> (Ex <sub>max</sub> 496 nm, 566 nm/Em <sub>max</sub> 578 nm) R-phycoerythrin (PE) is an accessory photosynthetic pigment found in red algae. It exists in vitro as a 240-kDa protein with 23 phycoerythrin chromophores per molecule. This makes PE the brightest fluorochrome for flow cytometry applications, but its photobleaching properties make it unsuitable for fluorescence microscopy.	
		561 nm	586/15	Dim	<b>BD Horizon RealYellow<sup>™</sup> 586 (RY586)</b> (Ex <sub>max</sub> 565-nm/Em <sub>max</sub> 586-nm) is small organic fluorochrome, driven by BD innovation, designed to be excited by the yellow-green laser (561 nm) with minimal excitation by the 488-nm blue laser. RY586 can be used instead of PE on conventional instruments equipped with a yellow-green laser (561 nm) or used with PE on spectral instruments. Compared to PE, RY586 is similar in brightness, has minimal spillover into blue detectors and has increased spillover into the 610/20-nm (PE-CF594) detector. Please ensure that your instrument configuration (lasers and optical filters) is appropriate for this dye.	
		488 nm 532 nm 561 nm	610/20	Dim	<b>BD Horizon<sup>™</sup> PE-CF594 (PE-CF594)</b> (Ex <sub>max</sub> 496 nm, 566 nm/Em <sub>max</sub> 612 nm) is a tandem conjugate, developed exclusively by BD Life Sciences, that combines PE and CF594. PE-CF594 is a brighter alternative to PE-Texas Red with improved spectral characteristics.	
		488 nm 532 nm 561 nm	670/14	Dim	<b>PE-Cy5</b> (Ex <sub>max</sub> 496 nm, 566 nm/Em <sub>max</sub> 667 nm) is a tandem conjugate that combines phycoerythrin and the cyanine dye Cy5. Because of its broad absorption range and the fact that its emission spectra are equivalent to APC, PE-Cy5 is not recommended for simultaneous use with APC. The Cy5 molecule has been shown to exhibit nonspecific binding to Fc receptors, which is most apparent on monocyte populations.	
		488 nm 532 nm	695/40	Dim	<b>PerCP</b> (Ex <sub>max</sub> 482 nm/Em <sub>max</sub> 678 nm) is a component of the photosynthetic apparatus found in the dinoflagellate <i>Glennodinium</i> . PerCP is a protein complex with a molecular weight of ~35 kDa. Due to its photobleaching characteristics, PerCP conjugates are not recommended for use on flow cytometers with high-power lasers (> 25 mW).	
		488 nm	695/40	Dim	<b>BD Horizon Brilliant<sup>™</sup> Blue 700 (BB700)</b> (Ex <sub>max</sub> 485 nm/Em <sub>max</sub> 693 nm) is a dye that was exclusively developed by BD Life Sciences as a brighter alternative to PerCP-Cy5.5. This dye also has less cross-laser excitation off the 405-nm laser, resulting in less spillover into the violet channels compared to PerCP-Cy5.5. Due to similar excitation and emission properties, BD Horizon <sup>™</sup> BB700 and PerCP-Cy5.5 cannot be used simultaneously.	
		488 nm 532 nm	695/40	Dim	<b>PerCP-Cy5.5</b> (Ex <sub>max</sub> 482 nm/Em <sub>max</sub> 678 nm) is a tandem conjugate that combines PerCP with the cyanine dye Cy5.5. PerCP-Cy5.5 is not subject to photobleaching like PerCP and can be used with stream-in-air flow cytometers. Additionally, the PerCP-Cy5.5 tandem conjugate is not as susceptible to fixative or light instability compared to APC-Cy7 and PE-Cy7.	
		488 nm 532 nm 561 nm	780/60	Dim	<b>PE-Cy7</b> (Ex <sub>max</sub> 496 nm, 566 nm/Em <sub>max</sub> 778 nm) is a tandem fluorochrome that combines PE and the cyanine dye Cy7. PE-Cy7 is sensitive to photo-induced degradation, resulting in loss of fluorescence and changes in spillover. Extreme caution must be taken to avoid light exposure and prolonged exposure to paraformaldehyde fixative. Fixed cells should be analyzed within 4 hours of fixation in paraformaldehyde or transferred to a paraformaldehyde-free buffer for overnight storage.	



Analyzers	Sorters	Excitation Laser Line	Filter	Relative Brightness	Red Laser (640 nm)
					Filter
BD Accuri <sup>™</sup> C6 Plus BD FACSCelebris <sup>™</sup> BD LSRIFortessa <sup>™</sup> Product Family <sup>*</sup> BD FACSymphony <sup>™</sup> Product Family <sup>*</sup> BD FACSAria <sup>™</sup> Product Family <sup>*</sup> BD FACSMelody <sup>™</sup> BD FACSymphony <sup>™</sup> S6 <sup>*</sup>		628 nm 633 nm 635 nm 640 nm	660/20	Dim	<b>APC</b> (Ex <sub>max</sub> 650 nm/Em <sub>max</sub> 660 nm) Allophycocyanin (APC) is an accessory photosynthetic pigment found in blue-green algae. Its molecular weight is approximately 105 kDa. Due to nearly identical excitation and emission properties, APC and Alexa Fluor <sup>™</sup> 647 cannot be used simultaneously.
		628 nm 633 nm 635 nm 640 nm	660/20	Dim	<b>Alexa Fluor<sup>™</sup> 647 (A647)</b> (Ex <sub>max</sub> 650 nm/Em <sub>max</sub> 668 nm) conjugates are highly photostable and remain fluorescent over a broad pH range. Due to nearly identical excitation and emission properties, APC and Alexa Fluor <sup>™</sup> 647 cannot be used simultaneously. APC tends to be brighter while Alexa Fluor <sup>™</sup> 647 is more optimal for intracellular applications. This fluorochrome exhibits uncommon photostability, making it an ideal choice for use in fluorescence microscopy.
		628 nm 633 nm 635 nm 640 nm	730/45	Dim	<b>BD Horizon<sup>™</sup> APC-R700 (A700)</b> (Ex <sub>max</sub> 652 nm/Em <sub>max</sub> 704 nm) is a tandem fluorochrome that combines APC with R700, a proprietary organic dye. This dye has been developed exclusively by BD Life Sciences as a brighter alternative to Alexa Fluor <sup>™</sup> 700. Due to similar excitation and emission properties, APC-R700, R718, and Alexa Fluor <sup>™</sup> 700 cannot be used simultaneously.
		628 nm 633 nm 635 nm 640 nm	730/45	Dim	<b>BD Horizon<sup>™</sup> Red 718 (R718)</b> (Ex <sub>max</sub> 695 nm/Em <sub>max</sub> 718 nm) is a small molecule fluorochrome with an emission max near 718 nm. R718 can be used as an alternative for Alexa Fluor <sup>™</sup> 700 or APC-R700 on instruments equipped with a red laser (628–640 nm) and a 730/45 nm filter. R718 is a bright dye with low nonspecific background staining. As such, R718 offers great resolving power on surface and intracellular markers. R718 enables the resolution of low expression markers without having to switch to a tandem dye (APC-R700), which can introduce residual emission and resulting spillover/spread into the APC channel. Due to similar excitation and emission properties, we do not recommend using R718 in combination with APC-R700 or Alexa Fluor <sup>™</sup> 700. R718 has been exclusively developed for BD Life Sciences.
		628 nm 633 nm 635 nm 640 nm	730/45	Dim	<b>Alexa Fluor<sup>™</sup> 700</b> (Ex <sub>max</sub> 696 nm/Em <sub>max</sub> 719 nm) is a far-red dye that can be excited with a 633–640-nm laser. This enables multicolor analysis in conjunction with APC or Alexa Fluor <sup>™</sup> 647 and APC-H7 or APC-Cy7 reagents. Due to similar excitation and emission properties, APC-R700, R718, and Alexa Fluor <sup>™</sup> 700 cannot be used simultaneously.
		628 nm 633 nm 635 nm 640 nm	780/60	Dim	<b>APC-Cy7</b> (Ex <sub>max</sub> 650 nm/Em <sub>max</sub> 779 nm) is a tandem fluorochrome that combines APC and the cyanine dye Cy7. Special precautions must be taken with APC-Cy7 conjugates, and cells stained with them, to protect the fluorochrome from long-term exposure to light. Fixed cells should be analyzed within 4 hours of fixation in paraformaldehyde or transferred to a paraformaldehyde-free buffer for overnight storage. Due to nearly identical excitation and emission properties, APC-Cy7 and APC-H7 cannot be used simultaneously.
		628 nm 633 nm 635 nm 640 nm	780/60	Dim	<b>APC-H7</b> (Ex <sub>max</sub> 650 nm/Em <sub>max</sub> 782 nm) is an APC-cyanine tandem fluorochrome that uses an analog of Cy7 and has similar spectral properties to APC-Cy7. APC-H7 conjugates provide greater stability in light and paraformaldehyde fixatives and have less spillover into the APC channel than APC-Cy7 conjugates. Due to nearly identical excitation and emission properties, APC-Cy7 and APC-H7 cannot be used simultaneously.



Relative Brightness Key: Dim Moderate Bright Brightest

Brightest dyes will be approximately as bright as PE while Dim dyes will have brightness similar to BD Horizon V500. Relative brightness is dependent on instrument configuration including lasers, filters, and laser power.

\* Capable of detecting up to 12 colors simultaneously (488 nm and 405-nm lasers available on all configurations; 355 nm, 561 nm and 640-nm lasers available on select configurations).

\*\* Capable of detecting up to 18 colors simultaneously. Contact your BD Representative for information on available laser wavelengths, laser powers and filter sets.

\*\*\* Capable of detecting more than 28 colors simultaneously based on chosen configuration. Contact your BD Representative for information on available laser wavelengths, laser powers and filter sets.

\*\*\*\* Capable of detecting up to 18 colors simultaneously (488-nm and 640-nm lasers available on all configurations; 355-nm, 405-nm and 640-nm lasers available on select configurations).

\*\*\*\*\* Capable of detecting up to 9 colors simultaneously (488-nm laser available on all configurations; 405-nm and 640-nm lasers available on select configurations).

BD flow cytometers are Class 1 Laser Products. For Research Use Only. Not for use in diagnostic or therapeutic procedures.

BD Life Sciences, San Jose, CA, 95131, USA

[bdbiosciences.com/colors](http://bdbiosciences.com/colors)

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