

Tide Fluor™ Dyes for Fluorescence Labeling and FRET Applications

- **Optimized to label peptides and nucleotides with performance comparable to Alexa Fluor® Dyes**
- **Optimized to pair with Tide Quencher™ dark acceptors to maximize FRET efficiency**
- **pH-insensitive and environment-insensitive fluorescence for developing robust assays**
- **Higher photostability to improve the quality of fluorescence imaging**
- **A variety of reactive forms available for conjugations**

The sulfonated cyanine dyes have improved fluorescence quantum yields compared to non-sulfonate cyanines. They are commercially available as Cy3®, Cy5®, Cy5.5®, and Cy7®. However, these commercial protein-labeling CyDyes and Alexa Fluor® dyes are cost-prohibitive for labeling peptides and oligonucleotides that require a much larger amount of labeling dyes. The improved and affordable Tide Fluor™ dyes are optimized as building blocks for developing FRET oligonucleotides and peptides. Our Tide Fluor™ dyes have stronger fluorescence and higher photostability than the classic fluorophores (such as fluoresceins, rhodamines, and cyanines). They are the best affordable fluorescent dyes for labeling peptides and oligonucleotides without compromised performance.

FRET Selection Guide of Tide Fluor™ Dyes

Tide Fluor™ Donor	Ex(nm)	Em (nm)	Features and Benefits	Ordering Information
Tide Fluor™ 1 (TF1)	341 nm	448 nm	<i>Alternative to EDANS</i> • Much stronger absorption • Much stronger fluorescence • Less environment-sensitive	#2236 (TF1 azide, Click chemistry) #2237 (TF1 alkyne, Click chemistry) #2238 (TF1 acid) #2239 (TF1 amine) #2242 (TF1 maleimide, SH-reactive) #2193 & #2194 (TF1 CPG, OH-reactive) #2244 (TF1 SE, NH ₂ -reactive)
Tide Fluor™ 2 (TF2) Tide Fluor™ 2WS (TF2WS)	503 nm 491 nm	525 nm 516 nm	<i>Alternative to FAM, FITC and Alexa Fluor® 488</i> • pH-insensitive fluorescence • Photostable	#2245 (TF2 acid) & 2348 (TF2WS acid) #2246 (TF2 amine) & 2351 (TF2WS amine) #2247 (TF2 maleimide, SH-reactive) #2350 (TF2WS maleimide, SH-reactive) #2248 (TF2, SE) & #2249 (TF2WS SE) #2252 (TF2 azide, Click chemistry) #2253 (TF2 alkyne, Click chemistry)
Tide Fluor™ 3 (TF3) Tide Fluor™ 3WS (TF3WS)	554 nm 551 nm	578 nm 563 nm	<i>Alternative to Cy3® and Alexa Fluor® 555</i> • Strong fluorescence • Photostable	#2254 (TF3 azide, Click chemistry) #2255 (TF3 alkyne, Click chemistry) #2268 (TF3 acid) & 2345 (TF3WS acid) #2269 (TF3 amine) & 2347 (TF3WS amine) #2270 (TF3 maleimide, SH-reactive) #2344 (TF3WS maleimide, SH-reactive) #2274 (TF3 phosphoramidite, OH-reactive) #2271 (TF3 SE) & #2346 (TF3WS SE)
Tide Fluor™ 4 (TF4)	578 nm	602 nm	<i>Alternative to ROX, Texas Red® and Alexa Fluor® 594</i> • Strong fluorescence • Photostable	#2285 (TF4 acid) #2286 (TF4 amine) #2287 (TF4 maleimide, SH-reactive) #2289 (TF4 SE, NH ₂ -reactive) #2300 (TF4 azide, Click chemistry) #2301 (TF4 alkyne, Click chemistry)
Tide Fluor™ 5WS (TF5WS)	649 nm	664 nm	<i>Alternative to Cy5® and Alexa Fluor® 647</i> • Strong fluorescence • Photostable	#2275 (TF5WS azide, Click chemistry) #2276 (TF5WS alkyne, Click chemistry) #2278 (TF5WS acid) #2279 (TF5WS amine) #2280 (TF5WS maleimide, SH-reactive) #2281 (TF5WS SE, NH ₂ -reactive)

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Tide Fluor™ 6WS (TF6WS)	682 nm	701 nm	<i>Alternative to Cy5.5®, IRDye® 700 and Alexa Fluor® 680</i> Strong fluorescence Photostable	#2291 (TF6WS acid) #2292 (TF6WS amine) #2293 (TF6WS maleimide, SH-reactive) #2294 (TF6WS SE, NH ₂ -reactive) #2302 (TF6WS azide, Click chemistry) #2303 (TF6WS alkyne, Click chemistry)
Tide Fluor™ 7WS (TF7WS)	756 nm	780 nm	<i>Alternative to Cy7® and Alexa Fluor® 750</i> • Strong fluorescence • Photostable	#2304 (TF7WS azide, Click chemistry) #2305 (TF7WS alkyne, Click chemistry) #2330 (TF7WS acid) #2331 (TF7WS amine) #2332 (TF7WS maleimide, SH-reactive) #2333 (TF7WS SE, NH ₂ -reactive)
Tide Fluor™ 8WS (TF8WS)	785 nm	801 nm	<i>Alternative to IRDye® 800</i> • Stronger fluorescence • Higher Photostability	#2306 (TF8WS azide, Click chemistry) #2307 (TF8WS alkyne, Click chemistry) #2335 (TF8WS acid) #2336 (TF8WS amine) #2337 (TF8WS maleimide, SH-reactive) #2338 (TF8WS SE, NH ₂ -reactive)

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Appendix I. Spectral Properties of Tide Fluor™ Fluorescent Labeling Dyes

Labeling Dye	Extinction Coefficient ¹ (cm ⁻¹ M ⁻¹)	Abs (nm)	Em (nm)	FQY ²	CF at 260 nm ³	CF at 280 nm ⁴
TF1	20,000	341	448	0.95	0.246	0.187
TF2	75,000	503	525	0.90	0.288	0.09
TF2WS	75,000	491	516	0.90	0.211	0.11
TF3	75,000	554	578	0.85	0.331	0.179
TF3WS	150,000	551	563	0.10 ⁵	0.079	0.079
TF4	90,000	578	602	0.91	0.489	0.436
TF5WS	250,000	649	664	0.25	0.023	0.027
TF6WS	220,000	682	701	0.18	0.111	0.101
TF7WS	275,000	756	780	0.12	0.009	0.049
TF8WS	250,000	785	801	0.08	0.103	0.109

Notes: 1. Extinction Coefficient at their maximum absorption wavelength; 2. FQY = fluorescence quantum yield in aqueous buffer (pH 7.2); 3. CF at 260 nm is the correction factor used for eliminating the dye contribution to the absorbance at 260 nm (for oligo and nucleic acid labeling); 3. CF at 280 nm is the correction factor used for eliminating the dye contribution to the absorbance at 280 nm (for peptide and protein labeling); 5. Fluorescence intensity is significantly increased upon coupled to proteins or long peptides.

Appendix II. Chemical Properties of Tide Fluor™ Fluorescent Labeling Dyes

Tide Fluor™ dyes have improved labeling performance than the classic fluorescent labeling dyes such as FITC, TRITC, Texas Red®, Cy3, Cy5 and Cy7. They are the best affordable fluorescent dyes (alternative to Alexa Fluor® dyes) for labeling oligos and peptides without comprised performance.

Labeling Dye	Cat#	Product Description	Reactivity	Adduct MW Calculation*
TF1	2236	Tide Fluor™ 1 azide [TF1 azide]	Azide	+ 301
	2237	Tide Fluor™ 1 alkyne [TF1 alkyne]	Alkyne	+ 270
	2238	Tide Fluor™ 1 acid [TF1 acid]	NH ₂ and OH	+ 215
	2239	Tide Fluor™ 1 amine [TF1 amine]	CO ₂ H	+ 257
	2242	Tide Fluor™ 1 maleimide [TF1 maleimide]	SH	+ 355
	2244	Tide Fluor™ 1 succinimidyl ester [TF1 SE]	Aliphatic amine	+ 215
	2240	Tide Fluor™ 1 CPG [TF1 CPG] *500 Å*	Oligo Synthesis	+ 288
	2241	Tide Fluor™ 1 CPG [TF1 CPG] *1000 Å*	Oligo Synthesis	+ 288
TF2	2245	Tide Fluor™ 2 acid [TF2 acid]	NH ₂ and OH	+ 469
	2246	Tide Fluor™ 2 amine [TF2 amine]	CO ₂ H	+ 511
	2247	Tide Fluor™ 2 maleimide [TF2 maleimide]	SH	+ 680
	2248	Tide Fluor™ 2 succinimidyl ester [TF2 SE]	Aliphatic amine	+ 469
	2252	Tide Fluor™ 2 azide [TF2 azide]	Azide	+ 555
	2253	Tide Fluor™ 2 alkyne [TF2 alkyne]	Alkyne	+ 524
TF2WS	2348	Tide Fluor™ 2WS acid [TF2WS acid]	NH ₂ and OH	+ 628
	2351	Tide Fluor™ 2WS amine [TF2WS amine]	CO ₂ H	+ 558
	2350	Tide Fluor™ 2WS maleimide [TF2WS maleimide]	SH	+ 767
	2349	Tide Fluor™ 2WS succinimidyl ester [TF2WS SE]	Aliphatic amine	+ 628
TF3	2254	Tide Fluor™ 3 azide [TF3 azide]	Azide	+ 526
	2255	Tide Fluor™ 3 alkyne [TF3 alkyne]	Alkyne	+ 495
	2268	Tide Fluor™ 3 acid [TF3 acid]	NH ₂ and OH	+ 440
	2269	Tide Fluor™ 3 amine [TF3 amine]	CO ₂ H	+ 496
	2270	Tide Fluor™ 3 maleimide [TF3 maleimide]	SH	+ 651
	2274	Tide Fluor™ 3 phosphoramidite [TF3 CEP]	Oligo Synthesis	+ 633
	2271	Tide Fluor™ 3 succinimidyl ester [TF3 SE]	Aliphatic amine	+ 440
TF3WS	2345	Tide Fluor™ 3WS acid [TF3WS acid]	NH ₂ and OH	+ 706
	2347	Tide Fluor™ 3WS amine [TF3WS amine]	CO ₂ H	+ 748
	2344	Tide Fluor™ 3WS maleimide [TF3WS maleimide]	SH	+ 846
	2346	Tide Fluor™ 3WS succinimidyl ester [TF3WS SE]	Aliphatic amine	+ 706
TF4	2285	Tide Fluor™ 4 acid [TF4 acid]	NH ₂ and OH	+ 544
	2286	Tide Fluor™ 4 amine [TF4 amine]	CO ₂ H	+ 586
	2287	Tide Fluor™ 4 maleimide [TF4 maleimide]	SH	+ 755
	2289	Tide Fluor™ 4 succinimidyl ester [TF4 SE]	Aliphatic amine	+ 544
	2300	Tide Fluor™ 4 azide [TF4 azide]	Azide	+ 630
	2301	Tide Fluor™ 4 alkyne [TF4 alkyne]	Alkyne	+ 599

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TF5WS	2275	Tide Fluor™ 5WS azide [TF5WS azide]	Azide	+ 818
	2276	Tide Fluor™ 5WS alkyne [TF5WS alkyne]	Alkyne	+ 787
	2278	Tide Fluor™ 5WS acid [TF5WS acid]	NH ₂ and OH	+ 732
	2279	Tide Fluor™ 5WS amine [TF5WS amine]	CO ₂ H	+ 774
	2280	Tide Fluor™ 5WS maleimide [TF5WS maleimide]	SH	+ 872
	2281	Tide Fluor™ 5WS succinimidyl ester [TF5WS SE]	Aliphatic amine	+ 732
TF6WS	2291	Tide Fluor™ 6WS acid [TF6WS acid]	NH ₂ and OH	+ 898
	2292	Tide Fluor™ 6WS amine [TF6WS amine]	CO ₂ H	+ 941
	2293	Tide Fluor™ 6WS maleimide [TF6WS maleimide]	SH	+ 1039
	2294	Tide Fluor™ 6WS succinimidyl ester [TF6WS SE]	Aliphatic amine	+ 898
	2302	Tide Fluor™ 6WS azide [TF6WS azide]	Azide	+ 1079
	2303	Tide Fluor™ 6WS alkyne [TF6WS alkyne]	Alkyne	+ 1048
TF7WS	2304	Tide Fluor™ 7WS azide [TF7WS azide]	Azide	+ 845
	2305	Tide Fluor™ 7WS alkyne [TF7WS alkyne]	Alkyne	+ 813
	2330	Tide Fluor™ 7WS acid [TF7WS acid]	NH ₂ and OH	+ 758
	2331	Tide Fluor™ 7WS amine [TF7WS amine]	CO ₂ H	+ 801
	2332	Tide Fluor™ 7WS maleimide [TF7WS maleimide]	SH	+ 899
	2333	Tide Fluor™ 7WS succinimidyl ester [TF7WS SE]	Aliphatic amine	+ 758
TF8WS	2306	Tide Fluor™ 8WS azide [TF8WS azide]	Azide	+ 1010
	2307	Tide Fluor™ 8WS alkyne [TF8WS alkyne]	Alkyne	+ 979
	2335	Tide Fluor™ 8WS acid [TF8WS acid]	NH ₂ and OH	+ 925
	2336	Tide Fluor™ 8WS amine [TF8WS amine]	CO ₂ H	+ 967
	2337	Tide Fluor™ 8WS maleimide [TF8WS maleimide]	SH	+ 1065
	2338	Tide Fluor™ 8WS succinimidyl ester [TF8WS SE]	Aliphatic amine	+ 925

* The molecular weight of the desired conjugate = the molecular weight of the free unlabeled molecule + the value listed in the table.