

SPRINGBOARD BIODIESEL'S SUMMARY OF TITRATION METHODOLOGIES

We receive a lot of questions regarding “grease quality”, and we’ve discovered that people titrate their oil in a number of different ways. As a result, Springboard Biodiesel always refers to the Free Fatty Acid (“FFA”) percentage of the oil, and we don’t encourage people to try and process oil in excess of 5% FFA (we also don’t encourage people to eat at restaurants that allow their grease to reach 5%FFA – and we’re not gourmands).

However, in order to clarify the various titration techniques and, importantly, results, we’ve put together the following cheat sheet.

FFA%: Self-explanatory. You’re looking for less than 5%. The lower the better

Typical KOH Titration: This will tell you how much KOH (in grams of KOH per liter of waste oil) you will need to completely neutralize the FFA of your oil. Thereafter, you will add a “base” amount to turn the fully neutralized grease into ASTM-compliant biodiesel (in a BioPro™, of course, we have taken care of you by supplying an exact recipe for all BioPro™ batches assuming 5% FFA or less oil)

Typical NaOH Titration: As with the method above, this reveals how much NaOH (again In grams of NaOH per liter of waste oil) you will need to completely neutralize the FFA of your oil. Thereafter, you will add a “base” amount to turn the fully neutralized grease into ASTM-compliant biodiesel (in a BioPro™, of course)

KOH Titration Plus Base: Here the titrator is adding the base amount needed to turn his/her grease into ASTM-compliant biodiesel (If you subtract 7 – the KOH base number – from all of the results you will see the same number as listed under “Typical KOH Titration”). While 7 grams is somewhat subjective, it represents a solid average for small-scale biodiesel producers

NaOH Titration Plus Base: Results reflect the addition of 5.5, the base number. Same methodological rationale as above – same “solid average” for 5.5 grams

Reminder: **REMEMBER THAT THE WATER CONTENT OF ALL OILS IS KEY. THE LESS WATER THE BETTER THE REACTION!**

Springboard Biodiesel - Easy Titration/FFA Calculator

FFA %	Grams/Liter of Oil Needed to Neutralize All of the Free Fatty Acids		Grams Needed to Convert 1 liter of Oil Into ASTM-grade Biodiesel	
	Typical KOH titration - (grams)	Typical NaOH titration - (grams)	KOH titration (adding the base amount)	NaOH titration (adding the base amount)
0	0	0	7	5.5
0.3	0.5427	0.3876	7.5427	5.8876
0.6	1.0854	0.7752	8.0854	6.2752
0.9	1.6281	1.1628	8.6281	6.6628
1.2	2.1708	1.5504	9.1708	7.0504
1.5	2.7135	1.938	9.7135	7.438
1.8	3.2562	2.3256	10.2562	7.8256
2.1	3.7989	2.7132	10.7989	8.2132
2.4	4.3416	3.1008	11.3416	8.6008
2.7	4.8843	3.4884	11.8843	8.9884
3	5.427	3.876	12.427	9.376
3.3	5.9697	4.2636	12.9697	9.7636
3.6	6.5124	4.6512	13.5124	10.1512
3.9	7.0551	5.0388	14.0551	10.5388
4.2	7.5978	5.4264	14.5978	10.9264
4.5	8.1405	5.814	15.1405	11.314
4.8	8.6832	6.2016	15.6832	11.7016
5.1	9.2259	6.5892	16.2259	12.0892
5.4	9.7686	6.9768	16.7686	12.4768
5.7	10.3113	7.3644	17.3113	12.8644
6	10.854	7.752	17.854	13.252
6.3	11.3967	8.1396	18.3967	13.6396
6.6	11.9394	8.5272	18.9394	14.0272
6.9	12.4821	8.9148	19.4821	14.4148
7.2	13.0248	9.3024	20.0248	14.8024
7.5	13.5675	9.69	20.5675	15.19
7.8	14.1102	10.0776	21.1102	15.5776
8.1	14.6529	10.4652	21.6529	15.9652
8.4	15.1956	10.8528	22.1956	16.3528
8.7	15.7383	11.2404	22.7383	16.7404
9	16.281	11.628	23.281	17.128
9.3	16.8237	12.0156	23.8237	17.5156
9.6	17.3664	12.4032	24.3664	17.9032
9.9	17.9091	12.7908	24.9091	18.2908