

Organic Application Note

Gross Heat in Fuel Oils

Instrument AC-350 Isoperibol Calorimeter

Standard 774-208 Benzoic Acid Pellet or other suitable standard

Sample Weight

0.5 to 0.75 grams (NOTE: Instrument range 6,000 to 15,000 BTU at 1 g)

Accessories

501-618 Syringe, 501-623 Needle, 774-204 Crucible, disposable eyedroppers, pressure-sensitive tape (cellophane tape 38 mm or 1.5 in. wide that is sulfur and chlorine free)

Procedure

1. Condition instrument by analyzing 1 g 774-208 Benzoic Acid Pellet.
2. Calibrate the instrument using 1 g benzoic acid pellet, following the procedure outlined in the operator's instruction manual.
3. After calibration, analyze an additional benzoic acid pellet to verify calibration.
4. a. *For Oils (Fuel Oil #2, #6, and lube oils)*
 - 1) Place crucible on balance and tare.
 - 2) Add oil into crucible using a disposable eyedropper.
 - 3) Enter weight and analyze.
*NOTE: Make corrections for sulfur, nitrogen, and fuse wire.*b. *For Jet Fuel*
 - 1) Place crucible on balance and tare.
 - 2) Remove crucible from balance and place a piece of pressure sensitive ("Scotch") tape across the top of crucible. Trim around edge with razor blade and seal tightly.
 - 3) Place a 3 by 12 mm strip of tape creased in the middle and sealed by one edge in the center of the tape disk to create a flap on top of the crucible.
 - 4) Place crucible on balance, record weight of tape (use weight of tape as spike weight), and tare.
 - 5) Using a syringe and needle, add the sample to the cup by inserting the needle through the tape disk at a point so that the flap of tape will cover the puncture upon removal of needle. Seal down flap by pressing lightly.
 - 6) Enter weight of sample. Take care throughout weighing to avoid contacting the tape or cup with bare fingers.
 - 7) Place cup in curved electrode and arrange fuse wire so that the loop presses down on the center of the tape disk.
 - 8) Assemble combustion vessel, place in instrument, and analyze. Make corrections for sulfur, nitrogen, and fuse wire.
NOTE: Determine BTU/LB of pressure sensitive tape by analyzing 1.2 g of tape in crucible. Repeat at least three times and use average of determinations as a spike value.
5. Every ten analyses perform a standard check by analyzing a benzoic acid pellet to verify calibration.



AC-350

Typical Results

Sample	Weight	BTU/LB
Jet Fuel #1	0.7418	19843
	0.7771	19792
	0.7534	19789
	average	19808
	std. dev.	30

Sample	Weight	BTU/LB
Jet Fuel #2	0.7380	19997
	0.7464	20016
	0.7584	20019
	average	20011
	std. dev.	12

Sample	Weight	BTU/LB
Jet Fuel #3	0.8175	19230
	0.7430	19259
	0.7498	19226
	average	19238
	std. dev.	18

Sample	Weight	BTU/LB
Paraffin Oil	0.7509	19763
	0.7594	19778
	0.7537	19772
	0.7584	19767
	0.7531	19766
	0.7550	19776
	0.7578	19771
	0.7594	19779
	0.7536	19764
	0.7646	19788
		average
	std. dev.	8

Sample	Weight	BTU/LB
Fuel Oil #2 (diesel)	0.7466	19321
	0.7448	19365
	0.7521	19319
	0.7440	19339
	0.7535	19361
	0.7432	19308
	0.7569	19358
		average
	std. dev.	23

Sample	Weight	BTU/LB
Fuel Oil #6	0.7480	17383
	0.7545	17367
	0.7670	17393
	0.7528	17364
	0.7637	17360
	0.7567	17375
	0.7577	17370
	0.7535	17374
	0.7579	17368
	0.7624	17374
	average	17373
	std. dev.	10



LECO Corporation
 3000 Lakeview Ave. • St. Joseph, MI 49085-2396
 Phone: 800-292-6141 • Fax: 269-982-8977
 info@leco.com • www.leco.com • ISO-9001 No. FM 24045