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HOW TO CALIBRATE A TEST THERMOMETER

Next to having Du-Lite's black oxide salts in your tank, the most important thing is to have an accurate thermometer.

1. There are two types of thermometers, one you can calibrate and one you cannot. The least expensive is a thermometer which cannot be calibrated and this type can lead you into a lot of trouble. These thermometers should be tested every three months by placing a pot of water on the stove and heating it until it boils vigorously. Place the stem of the thermometer in the boiling water and note the reading. At sea level, the boiling temperature is 212°F. If your thermometer reads a few degrees off, plus or minus, these numbers have to be added or subtracted from the proper operating temperature of your bath. For example, if your thermometer reads 207°F in boiling water - this 5°F difference must be taken away from the readings you get in the black oxide tank. If you want 285°F you must compensate for the inaccuracy of the thermometer by heating the solution to 290°F. If all this seems too complicated - buy a Du-Lite calibrated thermometer.
2. Calibrating a Du-Lite Thermometer: Place a small pot of water on your stove - heat to boiling, place the stem of the thermometer in the water for 45 seconds; note the reading. If the reading is not 212°F at sea level adjust the thermometer as follows: Place a 7/16 inch wrench on the nut located under the face of the thermometer. Turn the thermometer face so that the indicating pointer is pointing to 212°F at sea level. Your thermometer is now calibrated and accurate and can be used with confidence when checking the operating temperature of your black oxide solution or temperature controlling equipment. Calibrate your thermometer every three months.
3. To check the accuracy of your partlow controller, use your calibrated thermometer. If they do not have the same reading, readjust the partlow controller to read the same as your hand held thermometer. Make the adjustment to the partlow as follows: Remove cover. The hex shaft is located in the center at the bottom of the unit. Loosen set screw at threaded end of hex shaft. Using 3/16" wrench, turn shaft so that the temperature agrees with the setting of your calibrated test thermometer. Re-tighten set screw.
4. At higher elevations, water boils at lower temperatures. For instance, at an elevation of 5,000 feet water boils at 203°F. Water boils at sea level at 212°F. This nine degree difference must be subtracted from any recommended operating temperatures for Du-Lite's black oxide bath. For example, Steelkote runs at 280-285°F at sea level, but at an elevation of 5,000 feet it should be operated at 9 degrees less or 271-276°F.

Boiling Point of water and Du-Lite products at different altitudes

Altitude	Water Boiling Point °F	Steelkote Oper. Temp. °F	Oxiblak Oper. Temp. °F
Sea Level	212	280 - 295	290 - 295
+ 1000	210	278 - 293	288 - 293
+ 2000	208	276 - 291	286 - 291
+ 3000	206	274 - 289	284 - 289
+ 4000	204	278 - 287	282 - 287
+ 5000	202	271 - 285	280 - 285
+ 6000	201	269 - 284	279 - 284
+ 7000	199	267 - 282	277 - 282
+ 10000	193	261 - 276	271 - 276