

## NIST Traceable Instrument Certification Services

Chinook Engineering, manufacturer of the Streamline Pro™ MultiCal™ System and Streamline™ FTS provides NIST traceable certification services for the instruments commonly used to calibrate air pollution samplers. All certifications are performed using high-precision NIST traceable reference standards.

### 1. Streamline Pro™ MultiCal™ System

Models LX, M, S, SX, HL and H flow rate, flow temperature and ambient pressure are calibrated against our Critical Flow Venturis and primary standards for temperature and pressure. All parameters are NIST traceable, maintained in tight quality control. Model X flow rates are calibrated using a Dresser™ Roots® meter.

**Streamline Pro Model LX (0.5 – 7 lpm), Model M (0.9 – 19 lpm), Model S (2.0 – 20 lpm), and Model H (5 – 30 to 55 lpm)**

7 pt flow, 3 pt flow temperature, 3 pt Remote Temperature and 3 pt barometer certification ..... \$545/each

**Streamline Pro Model SX (2.0 – 25 lpm) and Model HL (3 – 25 to 30 lpm)**

7 pt flow, 3 pt flow temperature, 3 pt Remote Temperature and 3 pt barometer certification ..... \$610/each

**Streamline Pro Model X, 180 – 220 lpm**

7 pt flow, 3 pt flow temperature and 3 pt barometer certification ..... \$920/each

### As-Received Audits of Streamline Pro™ MultiCal™ Systems

3 point Model M or S flow check at approximately 15, 16.7, and 18.5 lpm ..... \$ 160/each

3 point Model H flow check at approximately 5, 16.7, and 22 lpm..... \$185/each

3 point Model SX flow check at approximately 3, 16.7, and 22 lpm ..... \$215/each

(Contact Chinook for prices of flow checks at other flow rates)

3 point audit of Barometric Pressure or Flow Temperature or Remote Temperature Probe..... \$160/each

**Streamline Pro™ MultiCal™ Systems can be modified and calibrated for other flow ranges.**

**Contact Chinook Engineering for details and prices.**

### 2. Streamline™ FTS flow meters

Streamline FTS flow meters are certified against our NIST traceable Critical Flow Venturis. White units typically calibrated 5-20 lpm, black units 0.5-6 lpm. Other flow ranges available.

7 point Streamline FTS certification (0.5-6 or 5-20 lpm) ..... \$275/each

3 pt “As-Received” flow check at approximately 15, 16.7, and 18.5 lpm..... \$130/each

3 pt “As-Received” flow check at approximately 2, 3, and 4 lpm..... \$130/each

Modify Streamline FTS orifice for a different flow range..... \$ 160/each

7 point Streamline FTS certification (5 – 25 or 5 – 30 lpm)..... \$305/each

### 3. Other FTS Audits and Certification of Accuracy

Chinook can conduct “As-Found” audits and corrections for many other brand FTS, but cannot modify calibration constants imbedded in the manufacturers’ proprietary firmware. Prices for these audits are determined by the number of Critical Flow Venturis used in the audit and the time and resource requirements. Audits of piston or bubble-type meters are typically conducted at 7 points over the flow range of each cell, with the reported values being the average of 10 repetitions of 10 readings at each of the 7 flow rates. Audits of venturi or orifice-type FTS are typically conducted at 7 points over the flow range of each cell, with adequate time for stabilization of sensors and flow between each reading.

7 point FTS Audit and Certification of Accuracy..... Contact Chinook to discuss flow rates and costs

### 4. Dry Gas Meter Calibration and Certification

Dry Gas flow meters (such as Schlumberger Model REMUS 4 G 1, 6) are certified against our NIST traceable Critical Flow Venturis using methods under 40 CFR 60, APP A-3, with three repetitions at five points within  $\pm 10\%$  of the target flow rate, which is typically 16.67 lpm.

15 point DGM certification (typically 15 – 18.5 lpm) ..... \$795/each

### 5. High Volume Sampler and PUF Orifice Transfer Standard Certifications

Hi Vol flow orifice transfer standards are calibrated against a Dresser™ Roots meter. Calibration apparatus and procedures adhere to EPA QA Handbook Section 2.11 specifications. PUF orifice transfer standards are performed with the same apparatus and procedures.

7 point Hi Vol OTS certification ..... \$205/each

7 point PUF OTS certification..... \$250/each

## **6. Manometers**

Electronic manometers are mounted in parallel with an NIST traceable precision well-type liquid manometer, an NIST recognized primary standard, and another electronic manometer. The manometer is zeroed and its accuracy is then checked under dynamic vacuum conditions. (40 inch W.C. maximum)  
*3 point NIST traceable electronic manometer certification..... \$135/each*

## **7. Barometers**

Electronic or mechanical barometers are placed in or mounted in parallel with a barometric chamber, fitted with a precision NIST traceable absolute barometer. An adjustable pressure variator allows establishment of stable barometric pressures in the range of expected use (please specify requested range, maximum 900 mm Hg).  
*3 point NIST traceable barometer certification..... \$135/each*

## **8. Thermometers**

Electronic or mechanical thermometers are placed in large thermal mass containers, fitted with a precision NIST traceable thermometer. Thermometers are typically certified at 0°C, and approximately 25°C and 42°C, reflecting normal ambient conditions. Higher and lower temperatures and additional points are available. (-50°C to 55°C temperature range)  
*3 point NIST traceable thermometer certification..... \$160/each*  
(additional points \$65 each; if below 0°C, \$40 if above 0°C)

*Note: Some instruments can be adjusted. If adjustment of instruments is desired, please provide an operating manual; contact Chinook Engineering for applicable charges.*

## **9. Hygrometers**

Electronic hygrometers are checked for accuracy by comparison with selected aqueous saturated salt solutions maintained in accordance with ASTM E 104-02.  
*3 point hygrometer certification..... \$215/each*

## **SHIPPING AND BILLING:**

### **Domestic Billing, Shipping and Handling:**

United States return shipping is billed at Chinook's cost when the shipment is through all UPS services or FedEx Air (\$25 additional handling charge for FedEx Ground shipments). A handling fee of 2.5% of the invoice is added for credit card payments. Return shipping is according to International Commercial terms 2010 (Incoterms 2010) rules, EXW at 555 Absaraka Street, Sheridan, WY. Service with DHL Express and Purolator is not available.

### **International Shipping:**

Payment of all past and current charges is expected at time of service and before instruments may be shipped. All payments must be in US dollars. A processing charge of \$120.00 will be added for preparation of customs-related shipping paperwork. International return shipping is according to International Commercial terms 2010 (Incoterms 2010) rules, EXW at 555 Absaraka Street, Sheridan, WY USA. Under EXW rules, the receiver of the equipment is responsible for all shipping, insurance, custom and tariff documents and fees. Service with DHL Express and Purolator is not available.

### **International Payment Methods:**

All payments must be in US dollars.

Credit Card (VISA or MasterCard accepted): A 2.5% processing fee will be added to the invoice.

Wire Transfer or non-USA bank check: A \$35.00 processing fee will be added to the invoice. Chinook must have verification of the payment before shipment of the equipment. Verification of payment can take two weeks or more for a check drafted on a non-USA bank.

For more information, contact:

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