



**UWAL**  
 University of Washington Aeronautical Laboratory

[www.uwal.org](http://www.uwal.org)



## **2015 Commercial Services & Rates Guide** **Effective January 1, 2015**

### **Introduction**

The University of Washington Aeronautical Laboratory (UWAL) is a subsonic wind tunnel testing organization. As a self-sustaining, non-tax-supported, university auxiliary enterprise, UWAL charges its customers in order to pay expenses and fund upgrades to the facilities. This guide describes the most common services UWAL provides for its customers at UWAL's main facility, the Kirsten Wind Tunnel. UWAL also has access to other facilities and is capable of providing additional services. Please contact UWAL if you have special testing requirements.

### **Arranging a UWAL Test**

A written instrument will be used for UWAL and each customer to define test dates, communicate estimated costs, and reiterate common indemnifications and separation of liabilities. A UWAL Work Agreement is to be used for this, unless the customer's Purchase Contract (or PO, etc.) proves more convenient and encompasses UWAL's requirements.

### **Minimum Charge and Standard Shift**

The Standard Shift for a test shall be defined in the Work Agreement (or contract) for the test. The default UWAL Standard Shift is 9 hours long and runs from 7:30 AM to 4:30 PM on business days.

For tests that can be done with manpower stretched out a bit, UWAL often agrees to 10 hour shifts running from 7:30 AM to 5:30 PM on business days. Other agreed-upon Standard Shifts have been arranged on rare occasions, when the time of year or number of people currently employed allowed.

The minimum charge per shift is the Standard Shift length hours in the Work Agreement times the applicable Occupancy Rate. Note the Idle-Time Policy in another section. The minimum charge for a 9 hour shift would therefore be \$4500 (9 times Regular Occupancy rate).

### **Rates Summary**

Kirsten Wind Tunnel Usage	
Occupancy	500.00USD hourly cost basis
Overtime Occupancy	600.00USD hourly cost basis
Idle-Time	2700.00 USD per day
Electronic Pressure Scanning	
EPS Setup and Usage	2500.00 USD (unlimited usage)*
Powered Model Testing	
Setup	call
Usage	100.00 USD per power-on hour
Deliverables	
Test Report (2 copies)	300.00 USD
Extra Printed Test Reports	100.00 USD each

\* The nature of using EPS systems is such that Occupancy gets used for calibration and offset zeroing.

Extra CD or DVD	100.00 USD each
Custom Services	
Software Programming	100.00 USD per hour
Electronics Support	100.00 USD per hour
Machine Shop Labor	100.00 USD per hour
Consumables	Our cost plus %16 plus sales tax

### **Wind Tunnel Occupancy**

Wind Tunnel occupancy is defined in a test's Work Agreement and by the policies established in this guide, in formal quotes, the Kirsten Wind Tunnel Technical Guide, and so on.

Tunnel Occupancy includes the following:

Tunnel rental including use of UWAL PC's for viewing data and doing test-related tasks.

Personnel to operate the tunnel, reduce the data, and assist with model changes.

Support for force & moment data acquisition, flow visualization, digital photographs and video.

Reasonable amounts of office supplies.

Use of UWAL Plotting and Wind Tunnel Data Organizer software packages.

Preliminary test data, digital images, and run logs on disc in PC format, prepared at the conclusion of the test.

Final test data, digital images, and run logs on disc in PC format, following completion of final data processing, if needed.

### **Consumables**

Consumables of significant cost will be billed at our cost plus%16. This mostly applies to the use of trip dots (typically \$12 to \$15 per foot) and video tape, but also to things we acquire specifically for your test.

### **Overtime Policy**

Overtime occurs whenever testing runs beyond the scheduled shift, or whenever testing is scheduled for a Saturday, Sunday, or University of Washington holiday. Overtime charges will be waived for time used to recover from Downtime. UWAL cannot guarantee that Overtime will be available.

### **Idle-Time Policy**

Occasionally customers may find themselves unable to continue with their test campaign. Perhaps a required model part is temporarily unavailable or the test matrix was completed ahead of schedule. If all UWAL-provided services have ceased and the situation is such that UWAL personnel can work on other projects, then the Company representative may request a switch to Idle-Time beginning the next day (assuming a multi-day test).

If the need to switch to Idle-Time occurs during a standard shift, the rest of that shift will be charged per the Regular Occupancy Cost-Basis (typically, data reduction, and other processing of test outputs continues to occur).

Charging in blocks of half-days can be discussed with UWAL management.

(The old policy of having Idle-Time be an hourly thing created an amount of discussion grossly disproportionate to Idle-Time revenue. Also, one time, the rate for "Idle-Time" got copied into pricing forms supplied to a gov't customer agency, causing a contract rejection and subsequent cycle of paperwork revisions.

### **Electronic Pressure Scanning**

UWAL has an Electronic Pressure Scanning (EPS) system, which is ideal for measuring large numbers of pressures. There is a per-test setup charge. EPS usage may be scheduled for an entire test, or only for specific portions of a test, at the customer's discretion. Please see the Kirsten Wind Tunnel Technical Guide for more information. If you would like to use EPS during your test please contact UWAL to discuss your pressure measurement objectives.

### **Powered Model Testing - Variable AC Electric**

Due to its infrequent usage, operation of the variable AC generator for AC Electric Powered Model Testing needs to be verified each time before UWAL commits to making it available. Call for status. The applicable equipment is an Auxiliary Motor-Generator Set, which is suitable for powering high power density induction motors that can be placed in wind tunnel models.

For AC electric powered model testing there may be setup costs for hourly tech labor, and a power-on usage charge. Note that this type of setup involves wiring and cooling water tubing beyond what may be on hand, and will likely have a materials charge. Contact UWAL to discuss your testing requirements.

### **Powered Model Testing – Combustion Engines**

It is possible to do test runs with a test article's combustion engine running. Due to associated health hazards such as carbon monoxide exposure, a Standard Operating Procedure must be followed that includes time for ventilation and requires that the carbon monoxide concentration in the test section and model deck drop to a safe level before personnel are allowed to work in those areas. There is no extra charge for this type of testing, but regular Occupancy Charges continue to accrue while ventilating during the hours of the Work Agreement's standard shift. Ventilation is done using two large exhaust fans on the top floor.

While airing out the wind tunnel circuit during recent powered tests with small, exhaust-producing engines, no CO was been detected in the Control Room or down in the UWAL shop, so work still got done. It is recommended to make a run plan such that engine-on runs happen late in the day, so that the wind tunnel airs out overnight (no charges outside contract's shift time). Contact UWAL to discuss your testing requirements.

### **Deliverables**

Some customers choose to have UWAL produce a formal, Boeing ANP-Style report documenting test times, data reduction terms, data reduction equations, selected images, and pdf-versions of logs.

Purchase of a test report includes printing and shipping of 1 or 2 hardcopies of the test report along with a disc (plus up to 3 copies) containing a digital version of the report in Adobe Acrobat PDF format, along with all of the test data and images. Additional hardcopies and discs may be purchased months or years after the end of a test depending on contractual or legal retention requirements.

### **Downtime Policy**

Downtime occurs whenever UWAL is responsible for a problem that takes more than 15 minutes to resolve and that prevents proceeding with the test. UWAL does not charge Tunnel Occupancy or Overtime rates during Downtime. Note that activities that are a part of UWAL's standard operating procedures, such as calibration routines or tunnel checkouts, are not considered Downtime.

UWAL makes reasonable efforts to ensure that its facilities are operational during scheduled tests. In the event that Downtime occurs, the facility will attempt to recover lost test time by offering additional test time, if available. For example, if the downtime causes a delay of one entire shift and no additional days are available after the scheduled end of test, then one option is to work extended (12-hour) shifts for the remainder of the test. UWAL cannot guarantee recovery of lost test time.