



ATC, Inc.  
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# ***LEAK TESTING PRESENTATION***

***Advanced Test Concepts (ATC), Inc.***

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Confidential

## ATC Facility in Indianapolis, IN



- ATC was started in 1986
  - Began building custom machine building
  - Specializing in Leak and Flow testing
  - Saw the need for a better method of leak testing
- 
- Developed the Micro-Flow sensor technology which is the basis for all of our equipment today!



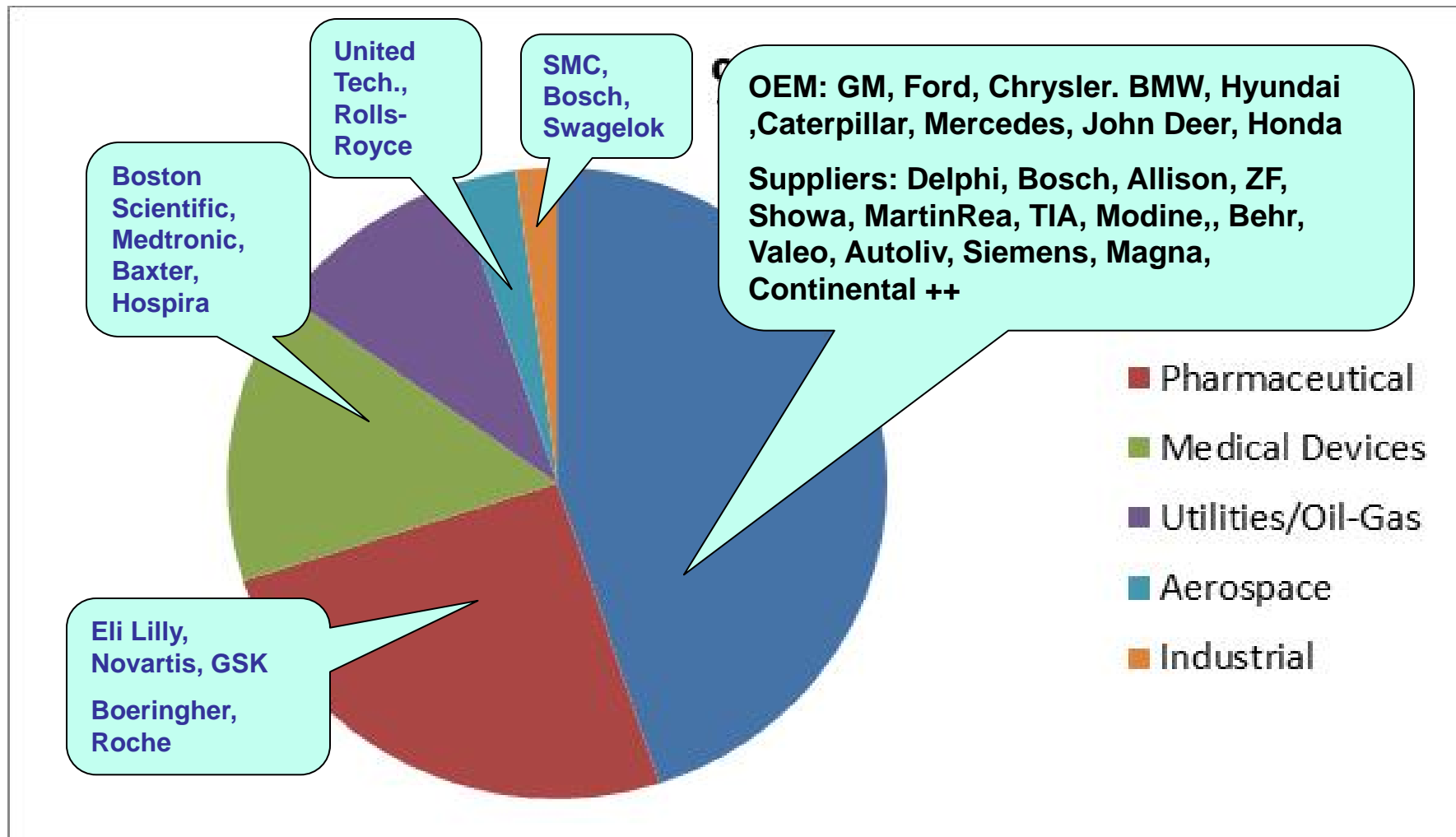
- ATC's Micro-Flow technology used in the industrial for over 20 years

- ATC is an Accredited Company per ISO 17025
- Certified by A2LA



- ATC Scope:
  - Leak Testing
  - Closure Integrity testing
  - Micro-Flow and Flow related Calibration

## ATC Global Sale by Industry





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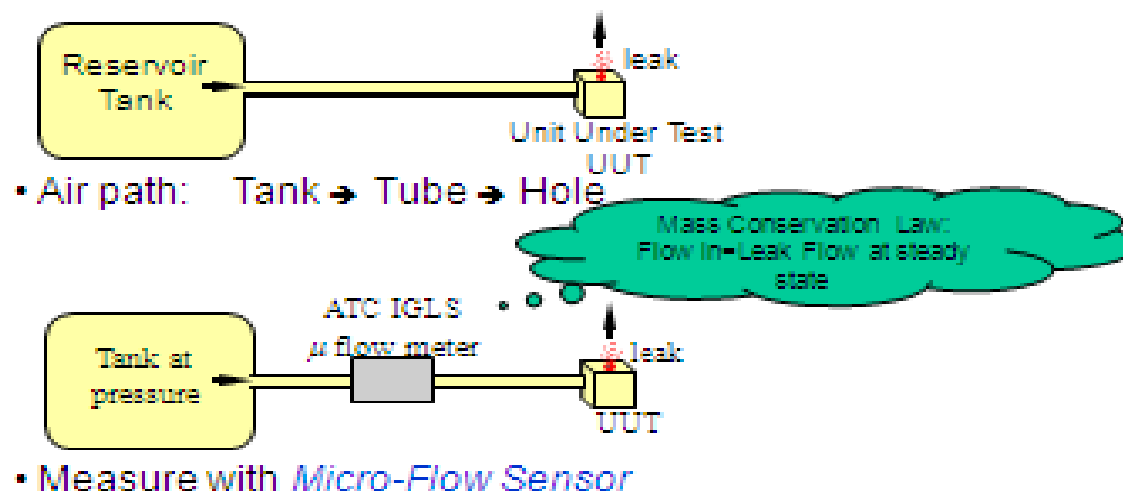
Fax: (317) 328-2686

# How It Works

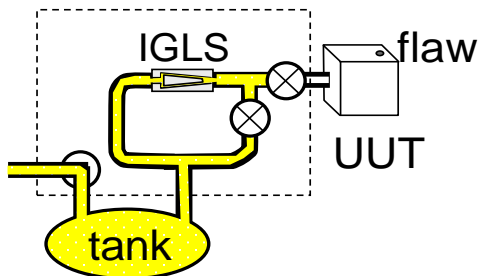
## How ATC's Micro-Flow Sensor Measures your Leak Flow? Pressure Test 11

### Pressure Test

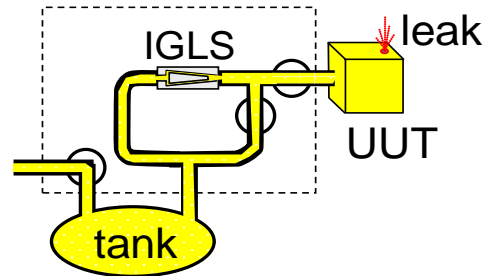
- Your product is simply pressurized, allowed air to leak to atmosphere.



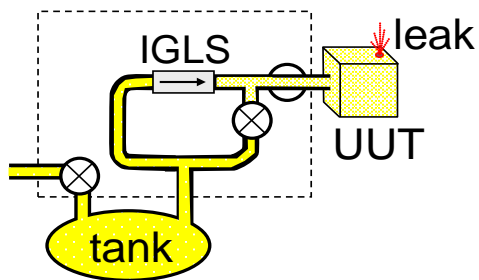
## Method of Operation – Pressure Test



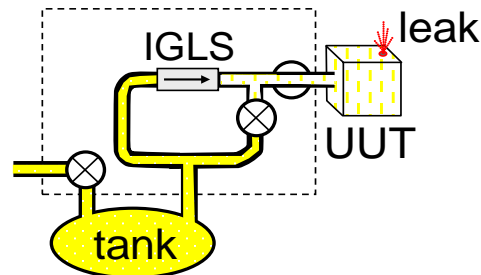
- 1 Standby** – Expansion tank  $P_0$   
– IGLS No flow



- 2 Fill** – All branches at  $P_0$   
– IGLS no flow, *flaw leaks*



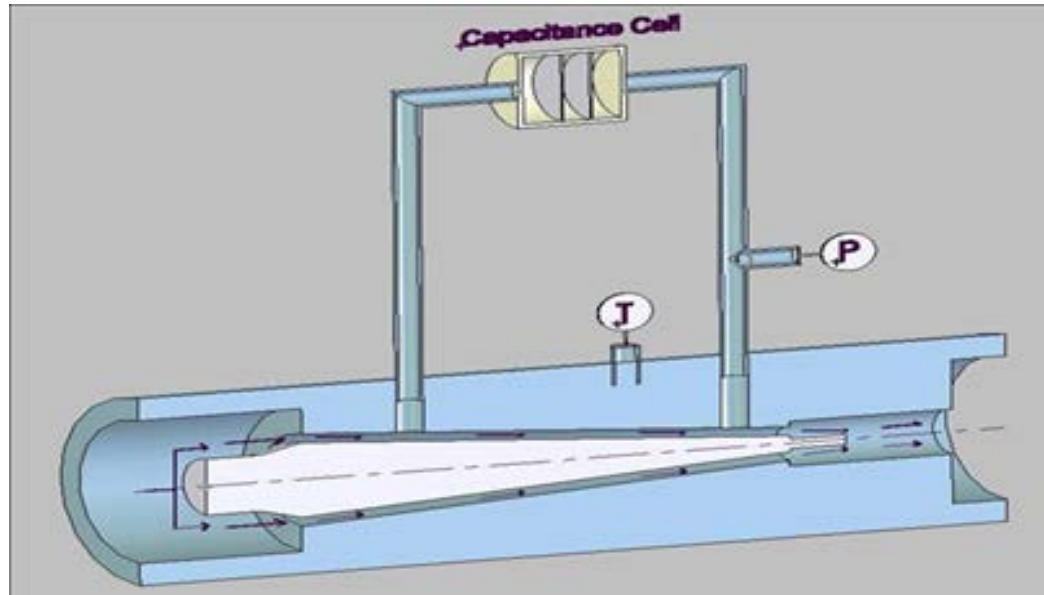
- 3 Stabilize** – Leak reduces  $P_{UUT}$   
– IGLS begins flow



- 4 Test** – Steady flow  $P_{UUT} < P_{\text{tank}}$   
– IGLS measures leak

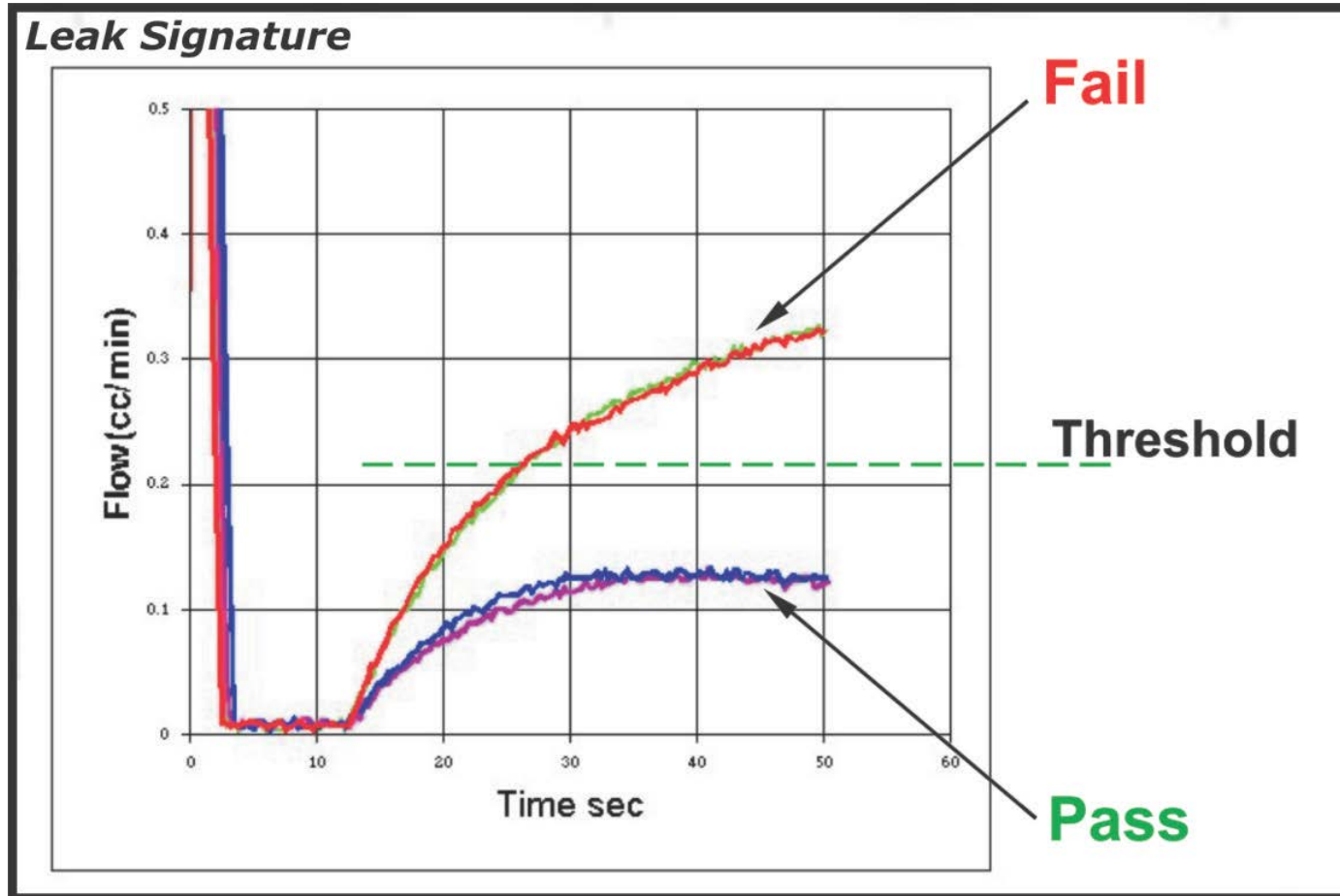


## Intelligent Gas Leak Sensor IGLS



- ATC utilizes our patented IGLS (Intelligent Gas Leak Sensor)
- The IGLS is an integrated micro-sensor based on ATC's accelerated laminar flow (ALF) design, measuring flow, pressure, and temperature
- The IGLS includes a built-in micro processor based leak test controller, which enables direct leak flow measure

# Test Data Result Signature Curve

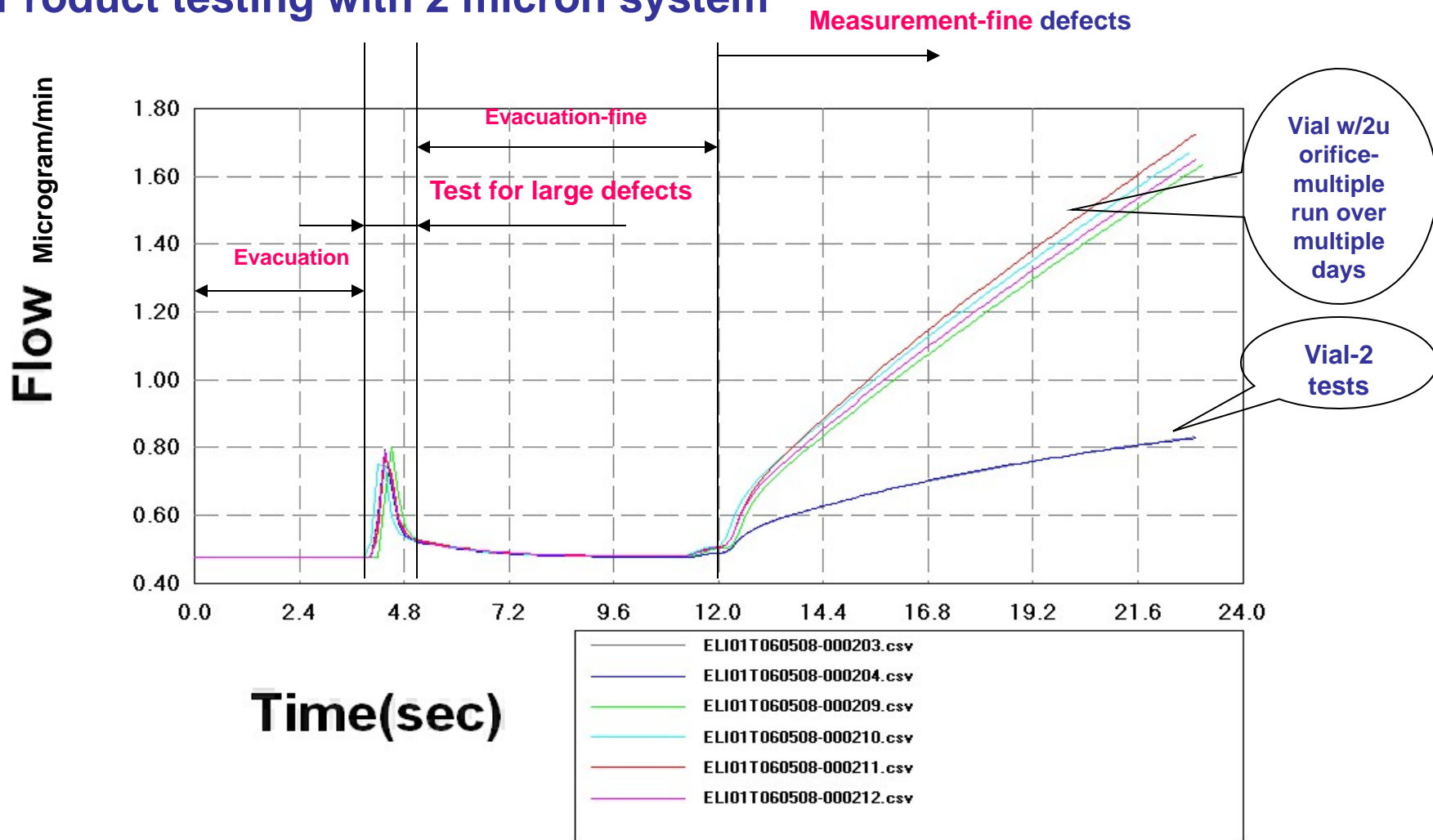


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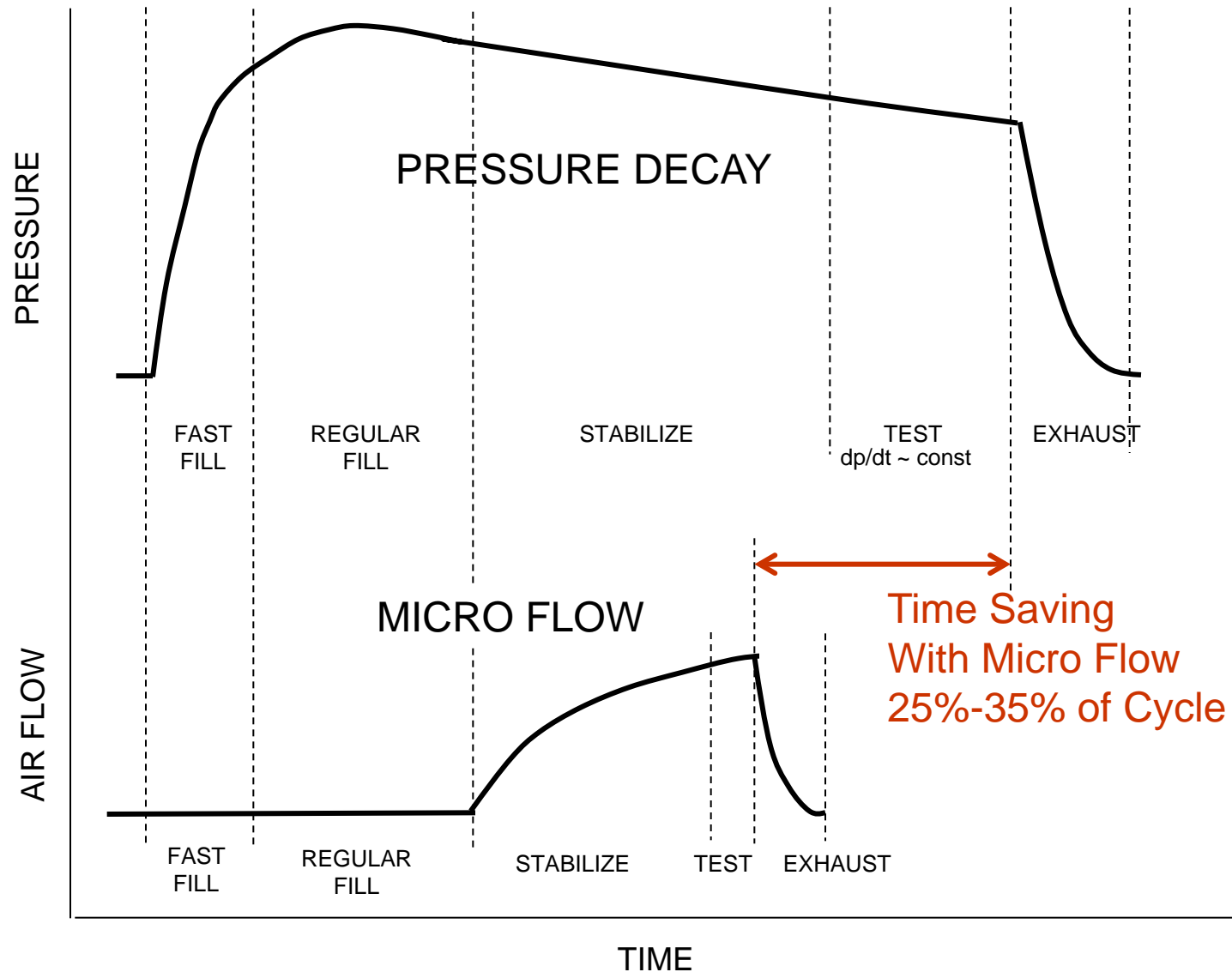


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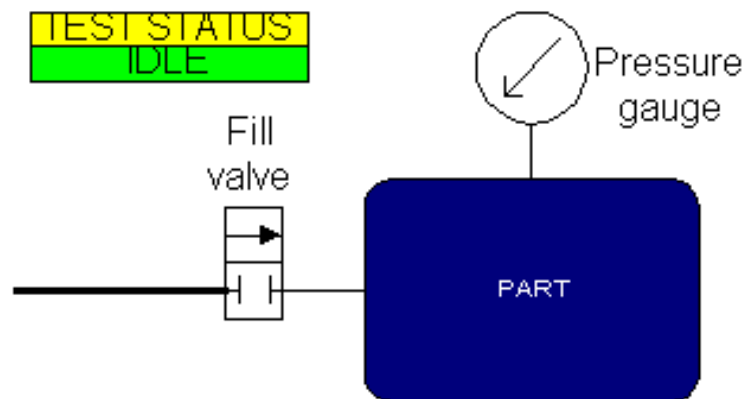
## Product testing with 2 micron system



## Why ATC's Micro-Flow Test faster than P-Decay/Vacuum increase methods?



## Typical Pressure Decay/Vacuum Increase Leak Test System



- Older technology, has existed for many years.
- Indirect leak flow measurement.
- Leak rate based on decay rate, test pressure. Test volume is calculated for every set up.
- This volume calc. is sometimes called “calibration” as we are using cal. orifices.

## IGLS Micro-Flow vs. Pressure Decay Systems

- IGLS Technology

- Measures direct flow
- Is temperature insensitive
- Is Volume insensitive
- Does not require frequent calibration
- High Accuracy
- Higher Achievable Gage R&R
- Typically 25-35% faster for same capability

- Pressure Decay

- Measures indirect pressure drop
- Is temperature sensitive
- Is Volume Sensitive
- Requires frequent calibration (high maintenance)
- Lower Accuracy
- Typically lower or equal instrument cost

## Common issues with pressure decay

- Indirect measurement - calculate leaks
  - Changing test volume bias reading
  - Operator must “calibrate” during part changeover
  - Operator can “zero” or mask a leak.
- Pressure transducer is often not rated for the required resolution.
- Temperature fluctuations causes errors!
  - Increases in temperatures will mask leaks
  - Decreases in temperature will cause false rejects
  - Requires frequent calibration to overcome drifts

## IGLS vs. Differential Pressure Decay Systems

- IGLS Technology

- Measures direct flow
- Is temperature insensitive
- Is Volume insensitive
- Does not require frequent calibration
- High Accuracy
- Higher Achievable Gage R&R
- Typically 15-20% faster for same capability.

- Diff. Pressure Decay

- Measures indirect pressure drop
- Is very temperature sensitive
- Is Volume Sensitive
- Requires frequent calibration (high maintenance)
- Twice the valves and connections, twice the chance for leaks in the system (high maintenance)
- Reference volume is required for each test part
- Over Pressure protection required
- Similar cost



## Verification Orifices

- ATC test instruments are equipped with a Verification Orifice
- Equivalent Micro-Geometry (EMG) is defined as Critical (Max. Allowed) Defect which can be reproduced as “verification orifices”.

Meets the requirements of US-CAR, SAE J2587 for US-CARB LEV II+ PZEV, EURO-5 Hydrocarbon Emission Standards an Major OEM's

ATC ECS Micro-Flow Channels will meet the Ford ES YU5A-9000 Standard

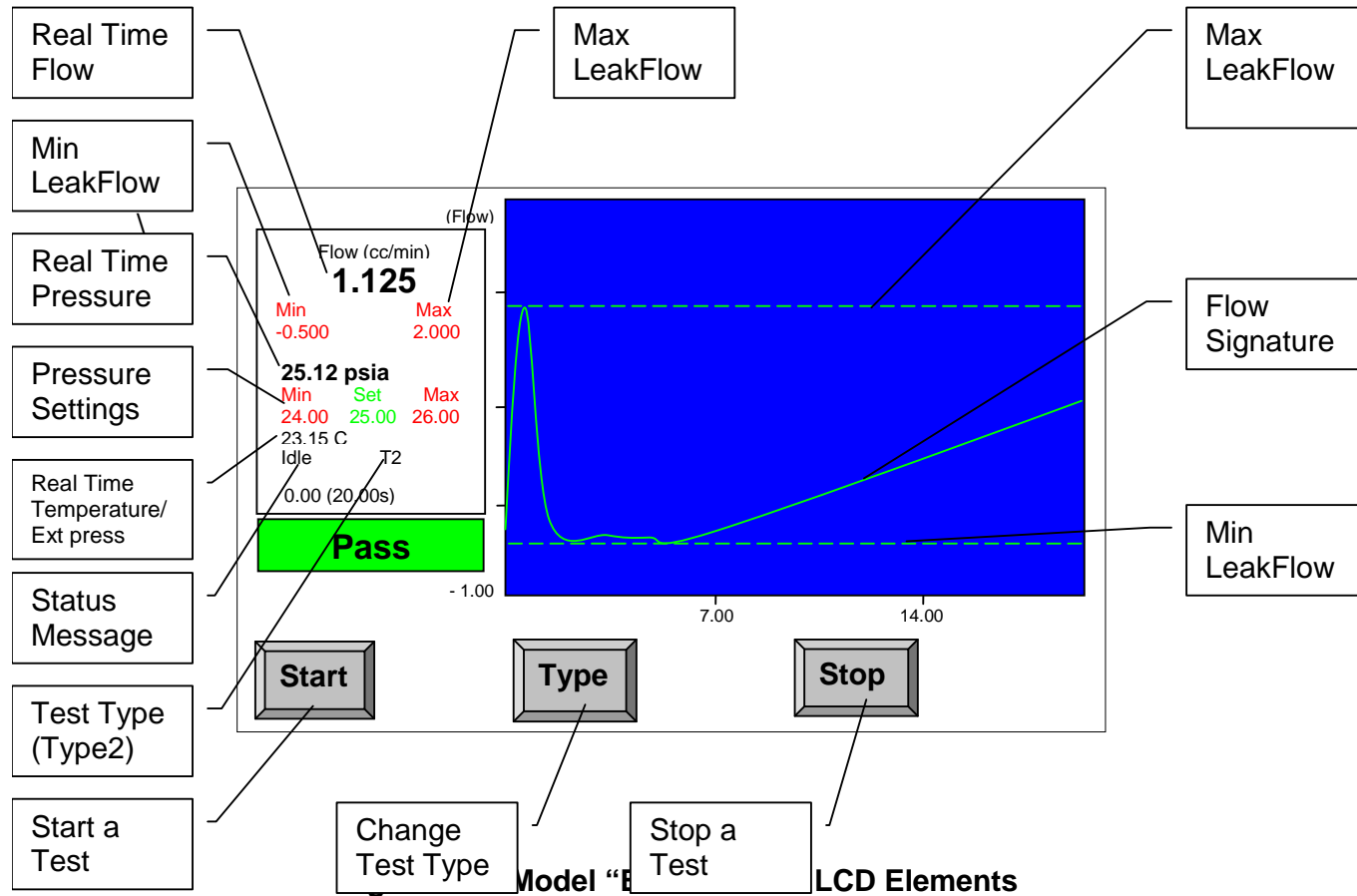
## Verification Orifice



## ATC's E2 Test Instrument



## Front Panel E2 and VE2 Tester



## Leak-Tek Software allows our customers the ability to change program times and limits

Leak-Tek 5/4/2007 9:27:33 AM

**Setup**

**Part Info**

Setup ID :

Part ID :

Sensor Name :

**Measurement Units**

Temperature :

Pressure :

Flow :

**Test Information**

**Flow**

Min Flow   
Max Flow

**Pressure**

Pressure Set :   
Pressure Max:   
Pressure Min:

**Gas**

Gas Type :

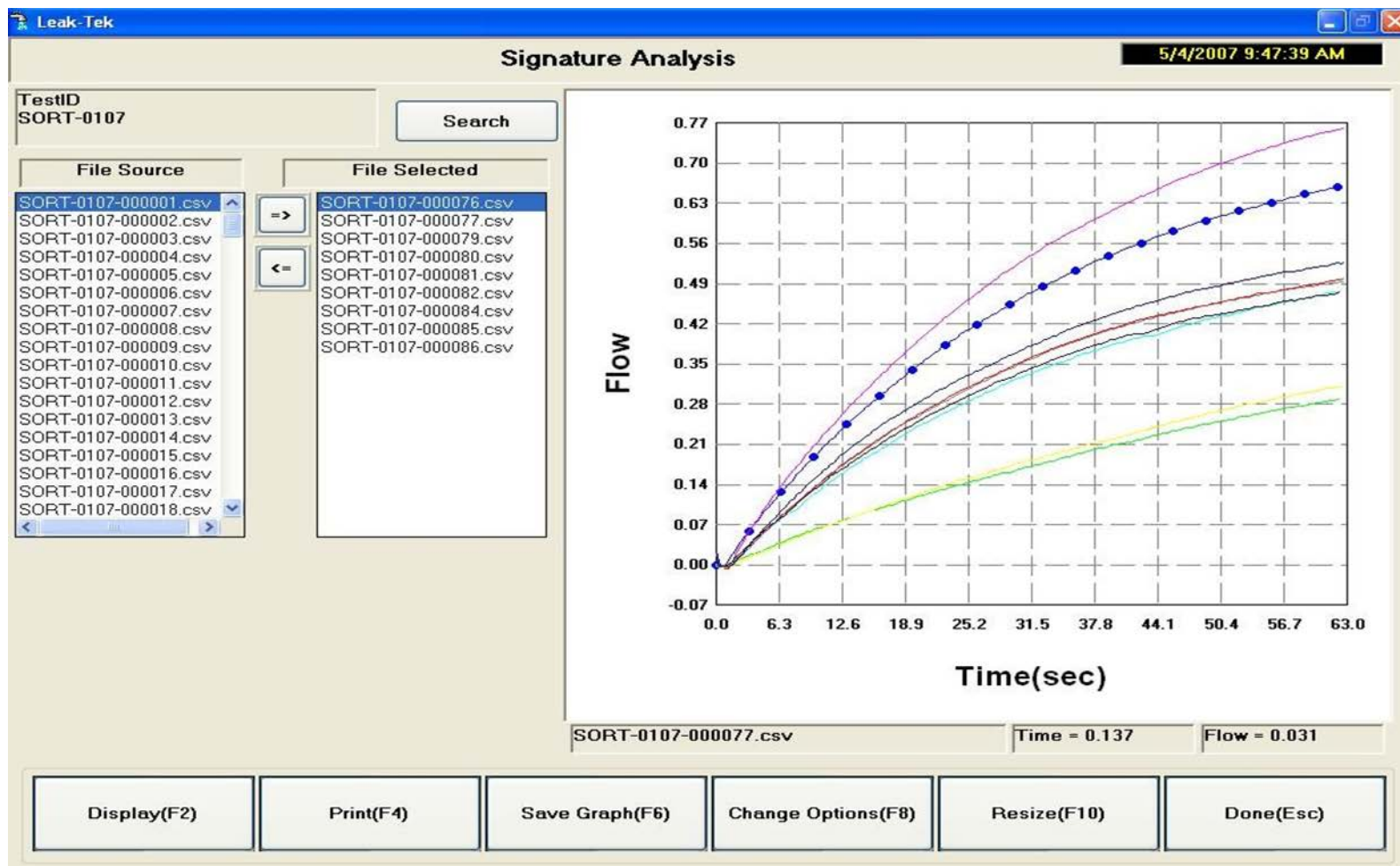
☒ Adaptive Test

**Time:**

No	Step Name	Time in secs
1	Clamp	0.010
2	Prefill	1.650
3	Fill	0.850
4	Stability	0.400
5	Test	3.000
6	Deplete	1.000
7	Done	0.010

**Leak Check at Test**

## ATC's Leak-Tek software will display Signature Analysis of Test Data



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- ATC has put the engineering and science back into leak testing and has developed some of the most sensitive and accurate Micro-Flow sensors and testing equipment in the market
- ATC provides to our customers engineered solution to their leak testing applications
- ATC engineered solutions will provide to you the most accurate leak testing solution with superior overall system stability while still offering system flexibility