

**TRIO-TECH**  
INTERNATIONAL

Series 480 TESTING SYSTEMS

**486 GROSS LEAK  
PRESSURE SYSTEMS**

## NECESSARY!

A PRESSURIZATION SYSTEM  
ASSURING MILITARY STANDARD  
MICROELECTRONICS GROSS LEAK TESTING

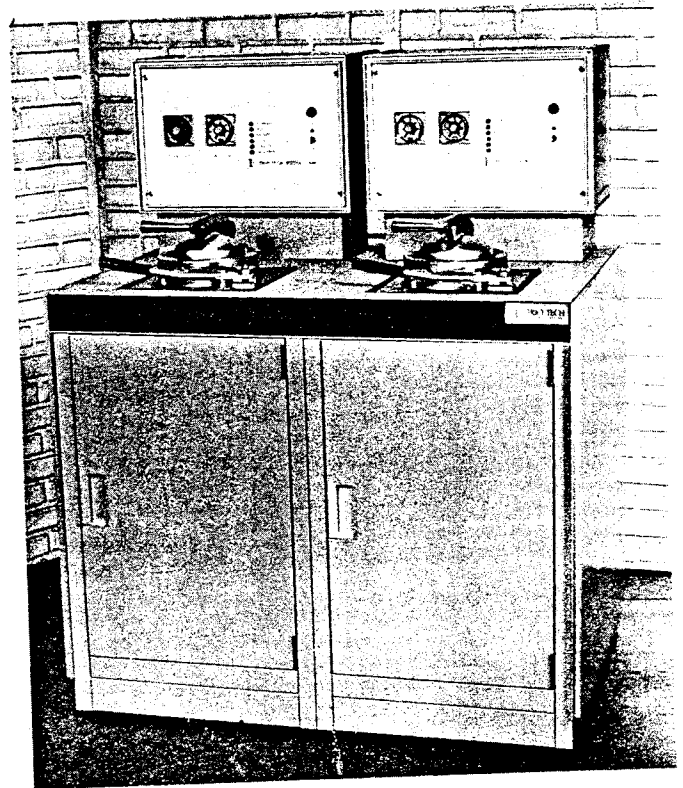
- FULLY AUTOMATIC – SOLID STATE
- OSHA APPROVED
- GROSS LEAK DETECTION  $\geq 10^{-5}$  atm cc/sec
- REDUCE COSTLY FLUORINERT® USAGE

Use Trio-Tech's Pressure System to gross leak test your microelectronic device to the latest MIL-STD-883C procedure.

- Reduce costly Fluorinert® usage
- Assure production continuity with on-time rapid testing
- Reduce semiconductor inventories by screening and shelving only Hi-Rel devices
- Reduce overhead due to completely automatic cycling
- Satisfy exacting MILITARY STANDARD procedures with equipment built around the Test Condition 'C' procedure

The Trio-Tech A-486 Series of Pressure Systems are designed specifically to comply in all respects to Test Condition C, Method 1014.5 of MIL-STD-883C.

Test Condition C – Fluorocarbon gross leak reads  
".... The devices shall be placed in a vacuum/pressure chamber and the pressure reduced to 5 torr and maintained for 1 hour except that for devices with an internal volume  $\geq 1 \text{ cm}^3$ , this vacuum cycle may be omitted. A sufficient amount of FC-72 or equivalent detector fluid shall be admitted to cover the devices. When the vacuum cycle is performed, the fluid will be admitted after the 1-hour period

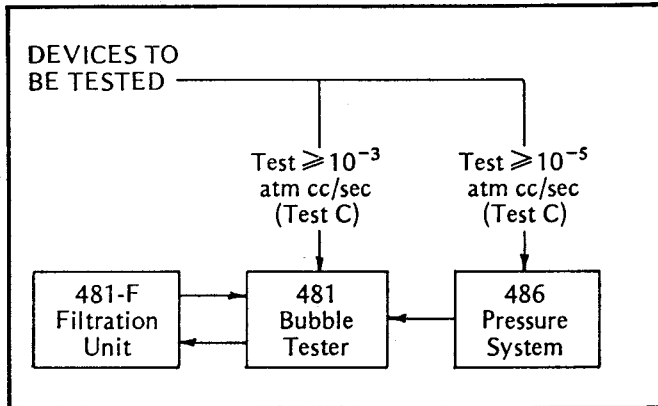


*but before breaking the vacuum....Devices with an internal cavity  $< 0.1 \text{ cm}^3$  shall be pressurized at 60 psig for a duration of 2 hours minimum. Devices with an internal cavity volume  $\geq 1 \text{ cm}^3$  may be subjected to 30 psig (45 if the vacuum cycle was omitted) for 10 hours if they cannot withstand the 60 psig, 2-hour condition....When the pressurization period is complete the pressure shall be released and the devices removed from the chamber without being removed from a bath of detector fluid...."*

From the beginning of the evacuation cycle thru the pressurization and vent cycle the sequence is completely automated. The chance for human error is virtually eliminated. Trio-Tech's years of proven expertise in the semiconductor processing and testing field assures you, the user, of Hi-Rel Military type microelectronics, the ultimate in performance and practical utility.

## SELECT THE SYSTEM NEEDED FOR YOUR GROSS LEAK TEST

The Flow Diagram below graphically depicts the Test Condition C gross leak test requirements for MIL-STD-883C, Method 1014.5. Be it leak detection  $\geq 10^{-5}$  atm cc/sec (Test C) or  $\geq 10^{-3}$  atm cc/sec, Trio-Tech 480 Series offers a total capability.



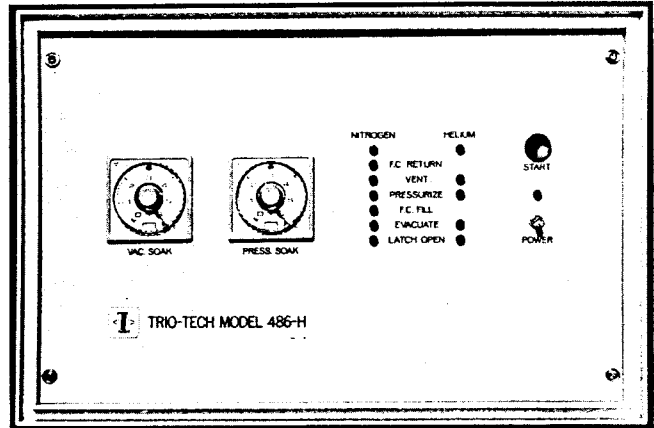
## BASIC THEORY BEHIND TEST C GROSS LEAK TESTING

In normal commercial gross leak testing the component is immersed in 125°C FC-48 Fluorinert® (or equal) and observed for the specified time period for bubbles emanating from the cavity of the component. Gross leakers  $\geq 1 \times 10^{-3}$  atm cc/sec will bubble due to increased pressure inside the component's cavity caused by the elevated temperature.

In the Test C gross leak test the component is pre-conditioned by a vacuum soak and pressurization cycle with FC-72 Fluorinert® (or equal) prior to performing the bubble test. Because FC-72 boils at 56°C, a much higher internal pressure inside a gross leaking component is present when the component is immersed in 125°C FC-40. Because of this increased pressure, it is possible to detect leak rates  $\geq 1 \times 10^{-5}$  atm cc/sec with a standard bubble test.

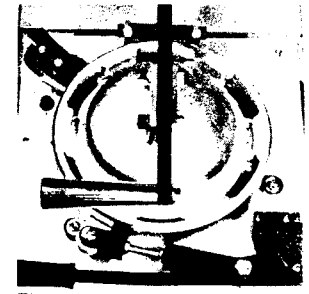
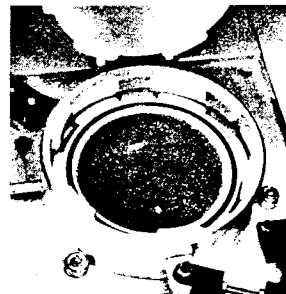
## CONTROL PANEL

The control panel is solid state, requiring only the setting of Vacuum and Pressure timers and activating the *START* sequence. Signal lights illuminate for: *LATCH OPEN*, *EVACUATE*, *F.C. FILL*, *PRESSURIZE*, *VENT* and *F.C. RETURN*. With the Helium use option, signal lights illuminate for: *LATCH OPEN*, *EVACUATE*, *PRESSURIZE* and *VENT*.



## INTERRUPTED THREAD TYPE HINGED CLOSURE

Each chamber is equipped with a closure mechanism receiving industry-wide acceptance for its durability, strength and long wearing characteristics. A highly efficient unit for both vacuum and pressure use, it affords a high degree of sealing capability and operator safety. Locking of the closure is accomplished with an over-center type locking lever. Once the closure is sealed and the locking lever is latched, any internal pressure will prevent the opening of the chamber.



## CHAMBER LIQUID LEVEL CONTROL

Each chamber is supplied a bottom and top level sensor. On both *F.C. FILL* and *F.C. RETURN*, this redundant feature assures proper FC level prior to pressurization, total FC storage return on *VENT* and *F.C. RETURN* cycles. Level sensors are pneumatically dampened preventing any Fluorinert® loss during chamber depressurization mode.

## VENT/EXHAUST CHILL SYSTEM

Chamber depressurization is vented into a 3 ft.<sup>2</sup> surface area chiller exchanger. Actual system pressure reduction to atmosphere is achieved on a gradual basis assuring condensation within the closed system of all entrapped Fluorinert® vapors. Chiller uses normal service water or can be equipped for brine or other refrigerant service. Chiller water is automatically activated during *F.C. FILL*, *VENT*, and *F.C. RETURN*. A manual override control switch will allow chill water to be optionally activated at any point in the sequence or during storage charging.

## FLEXIBILITY AND ADAPTABILITY FOR CURRENT OR FUTURE REQUIREMENTS

The Trio-Tech Model A-486 is designed to perform the evacuation and pressurization portion of MIL-STD-883C, Method 1014.5, Condition C. This is done completely automatically with independent control of from one to four separate chambers as may be suited to your specific production needs.

Each chamber position has its own timer, combination vacuum/pressure monitoring gauge. A large capacity (5CFM) vacuum pump reduces pump-down time to a minimum during the evacuate phase. Vacuum level is accurately controlled with an adjustable Indicator-Controller.

The activation chambers are provided with safety interlocked quick release mechanisms. You are assured of OSHA compliance with no compromise to safety.

The standard A-486 system will pressurize approximately 800 14- or 16-lead DIPs per cycle per chamber. Optional deep chamber systems double this capacity.

Whether a one, two, three or four-chamber system, automatic level control of Fluorinert® is provided for individual chambers, Fluorinert® is passed thru a micron filter during each activation cycle, automatic shutoff occurs in the case of insufficient Fluorinert® supply, and a simple one-step action latches the chamber cover. Whether purchased as a stand-alone pressure system, or used in conjunction with the Trio-Tech Model G-203 Bubble Tester, the Model A-486 assures compliance with all present and future Military Standard callouts for MIL-STD-883C, MIL-STD-750C and MIL-M-38510.

## SERVICE

As is the case with Trio-Tech CENTRISAFE® centrifuges and TRACER-flo® Process semiconductor processing equipment, the A-486 Pressure System is backed by a complete service capability in all major cities in the United States and overseas. Competent technical personnel are ready to assist with timely service, should the need arise.



For more information on how your testing program will meet the exacting requirements of MIL-STD-883C, call or write your nearest Trio-Tech Representative or contact us directly.

## SPECIFICATION SELECTION GUIDE

SPECIFICATION	MODEL A-486-1	MODEL A-486-2	MODEL A-486-1DS	MODEL A-486-2DS
Number of Chambers	1 ea 16" deep	2 ea 16" deep	1 ea 30" deep	2 ea 30" deep
Overall Outside Dimensions (approx.)	24" wide x 32" deep x 56" high	48" wide x 32" deep x 56" high	24" wide x 32" deep x 56" high	48" wide x 32" deep x 56" high
Pressure Soak Time Controller	0-60 Hr max – 1 ea	0-60 Hr max – 2 ea	0-60 Hr max – 1 ea	0-60 Hr max – 2 ea
Vacuum Soak Time Controller	0-60 Hr max – 1 ea	0-60 Hr max – 2 ea	0-60 Hr max – 1 ea	0-60 Hr max – 2 ea
Activation Chamber(s) Size	1 ea 1.7 gallon	2 ea 1.7 gallon	1 ea 3.2 gallon	2 ea 3.2 gallon
Fluorinert® Storage Capacity	6 gallons	12 gallons	12 gallons	12 gallons
Individual N <sub>2</sub> Regulator and Indicator	1 per chamber			
Chamber Combination Pressure Indicator 0-30" Hg; 0-150 psi; ±3%	1 per chamber			
Line Pressure Indicator – Bourdon Tube 0-160 psi ±2% F.S.	1 per system			
Vacuum Indicating Controller	atm to .1 torr			
Vacuum Pump	1 ea 5CFM			
Gas Supply	Regulated Dry N <sub>2</sub> @ 90 psig or Filtered Dry Air			
Power	240/120 VAC @ 30 A, 50/60 Hz			

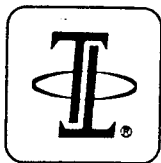
### OPTIONAL FEATURES

Part Number

Part Number

Valving and Controls for system use with Helium or Fluorinert®	-H
Filler Block, converts 30" deep chamber to 16" deep chamber	486394-B
Filler Block, converts 30" deep chamber to 10" deep chamber	486394-500
Filler Block, converts 16" deep chamber to 10" deep chamber	486394-501
2 - Stainless Steel Component Bucket, 5" deep	48644
2 - Stainless Steel Component Bucket, 10" deep	48644-500
Stainless Steel Component Bucket, 24" deep	48644-501

"Stacked" Stainless Steel Component Bucket Set (10" chamber) – 2 each 2¾" deep buckets with Carrier	486111
"Stacked" Stainless Steel Component Bucket Set (10" chamber) – 3 each 2" deep buckets with Carrier	486252-501
"Stacked" Stainless Steel Component Bucket Set (16" chamber) – 3 each 3" deep buckets with Carrier	486111-500
"Stacked" Stainless Steel Component Bucket Set (16" chamber) – 6 each 1½" deep buckets with Carrier	486111-501
"Stacked" Stainless Steel Component Bucket Set (30" chamber) – 3 sets of 6 each 1¾" deep buckets with Carrier	486379



# TRIO-TECH

INTERNATIONAL

2040 North Lincoln Street • Burbank, California 91504, USA  
 [818] 846-9200 • Cable: TRILOCAL  
 TLX 194811 [TTI INTL BUBK]

*For additional information on this or other Trio-Tech products – TRACER-flo® Process Fine Leak Detection Systems, Gross Leak Bubble Testers, Helium Fine Leak Detection Systems, CENTRISAFE® Centrifuges and Fixturing, and Testing Services – please contact our Burbank office directly or the local Representative in your area.*

Other Trio-Tech Facilities:  
 Mountain View • 1400 Stierlin Road • [415] 969-9600  
 Singapore • Block 3, 1004 Toa Payoh North, 07 - 01 to 07 • 254-0255  
 London • 2 Mill Close, Denmead, Hampshire • 7014-57601