



Krytek-300 Ion Source Conditioner

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Ideal Implanter Operation

Predictable:

High-availability with near-zero maintenance variability

Flexible:

Adapt quickly to synchronize scheduling of quals, PM's, Etc.

Agile:

Rapid lot-to-lot setup/changeover

Ultra Clean:

Minimize Particles and Cross Contamination

Low Cost:

Excellent OEE performance to minimize tool count



Krytek-300 Attributes

- The Krytek-300 is an Ion Implant Productivity Improvement Tool
- Typically one hour shorter source exchange time when everything occurs as expected and the implanter returns to operation smoothly
- Removes contaminants from the surfaces of the source prior to exposure in the implanter
- Minimizes the risk of extended downtime events due to infant mortality
- Improves predictability and reduces variability for overall wafer fab performance



Krytek-300 Features

- Automated test and condition sequence
- Automated vacuum and cooling water leak testing
- Electrical pre-testing - Arc voltage, filament, TC, etc..
- Pre-out gassing of filament and arc chamber
- Arsenic oxide, Indium Chloride burn-off
- Vacuum storage of conditioned sources ready to use
- Designed to process sources and components from all the major Implant OEM's



Krytek-300 Conditioner Process

Process

1. Install source.
2. Start automated recipe.
3. Source pumps down to set point.
4. Leak check.
5. Thermo-couples and water flow tested.
6. Filament ramp (pressure monitored for over pressure and adjust ramp).
7. Arc check (checks for short in filament to arc chamber at temperature).
8. Vaporizer test.
 - Vaporizer short/ open test.
 - Vaporizer ramp and hold at temperature.
 - Vaporizer heater test (voltage Vs Current at temperature).
9. Cool down vaporizer (quick cool if applicable).
10. Cool down filament.
11. Print and save report.
12. Shut down and vent of manifold.
13. System ready for next source.

• Computer

- Industrial PC
- Windows XP Platform
- Krytek 300 Software
- Inficon Tware lite (RGA)
- Varian Turbo-V 301 SW

• Software

- Recipe-driven automated testing and conditioning sequence
- Record of test stored to industrial PC for easy export and printing
- Rapid fault identification
- Automated and manual leak checking



Krytek 300 Systems

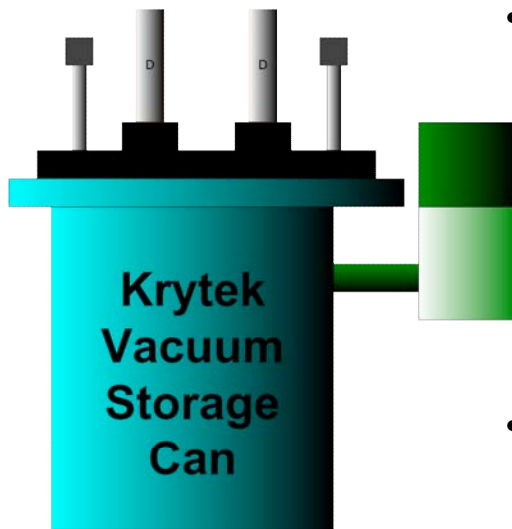
• Vacuum System

- Standard pumping system
- Varian 300 dry scroll pump
- Varian Turbo-V 301 Navigator
- Inficon RGA
- Pfeiffer full range pressure gauge
- Varian pneumatic valving

• Power Supplies

- XANTREX Filament Power Supply (2.5KW) Optional (10V,250 amp or 20V 125 amp)
- XANTREX Emission Power Supply (1 KW) 600 Volt 1.6 Amps
- XANTREX Vaporizer Power Supply (1 KW) 100 Volt 10 Amp
- Arc Power Supply - 1.7 KV, 1.3 mA

Krytek Storage:



- Source Stored under Vacuum after Conditioning
 - No Moisture Added
 - No Oxide Formation
 - No Added Particulates
- Minimal Implanter Conditioning Needed
- Ready to Operate at Short Notice

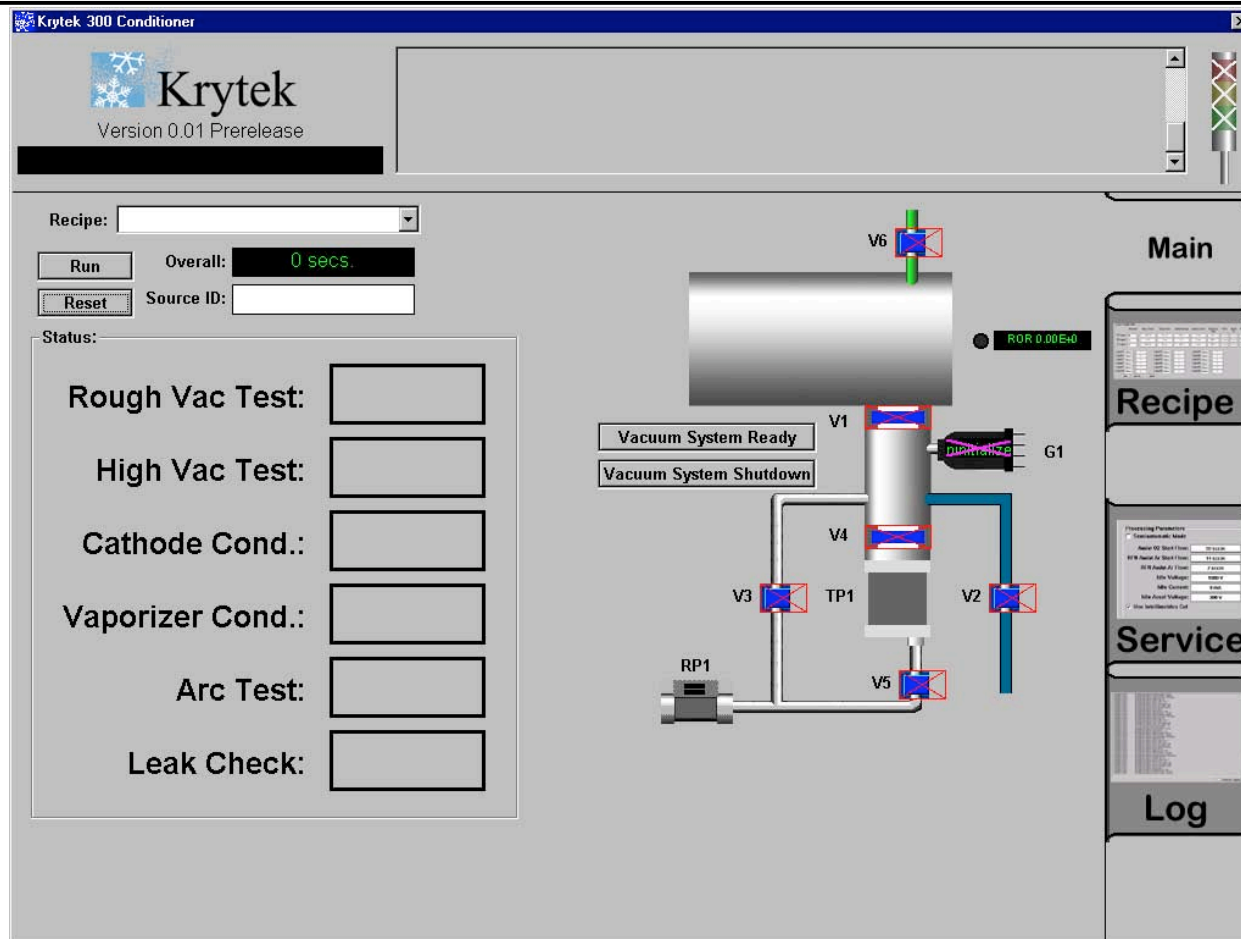


The Krytek 300 - Operation

- The Krytek-300 is completely automated and minimizes the need for technician intervention
- The Krytek-300 is pre-programmed for reproducibility with specific recipes for each source model




Main Page



Recipe Page

Krytek 300 Conditioner

 **Krytek**
Version 0.01 Prerelease

Recipe:

Description: Recipe Type:

☒ Test Water Flow

☒ Rough Vac: Within:

☒ High Vac: Within:

☒ Leak Check ☒ Helium Check

☒ TCs Connected: ☒ #1 ☒ #2 ☒ #3 ☒ #4

☒ Preheat Filament: at:

☒ Condition Cathode: Within: Pressure: Max Voltage:

☒ Keep Cathode at Power:

☒ Arc Check

☒ Vaporizer Check


☒ Cathode at:

☒ Ramp Vap.: Within: Max Voltage: Then Hold:

☒ Check Vap.: Current: To:

☒ Pre-Cool Cathode: For:

☒ Cooldown: ☒ Use Quick Cool



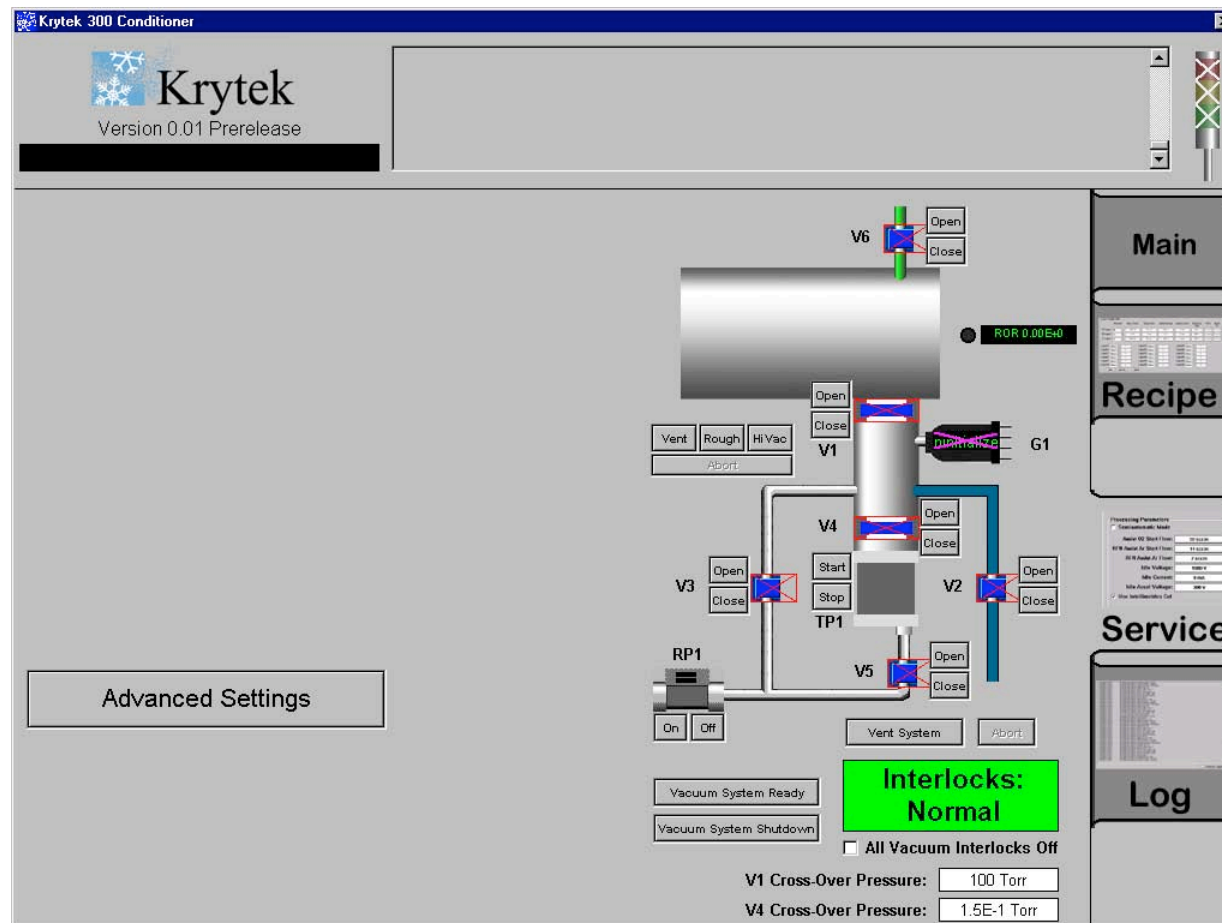
Main

Recipe


Service

Log

Service Page





Raw Input / Output Page




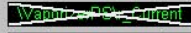
Krytek
Version 0.01 Prerelease


Analog PCI-DAS1000


Channel 0: 


Filament PS Current: 


Filament PS Voltage: 


Vaporizer PS Current: 


Vaporizer PS Voltage: 


Emission PS Current: 


Emission PS Voltage: 


Arc PS Current: 


Arc PS Voltage: 


TC 1: 


TC 2: 

TC 3: 

TC 4: 

Vacuum Gauge (raw): 

Channel 14: 

Channel 15: 

Analog Out PCI-DDA04-12

Filament PS Current:

Vaporizer PS Voltage:

Emission PS Current:

Arc PS Voltage:

Digital PCI-DDA04-12

☒ Doors Closed
 ☐ V5 Open

☒ V1 Open
 ☐ Water On

☒ He Pressure OK
 ☐ Bias Test Switch

☒ RP1 On
 ☐ Arc Test Switch

☒ Water Flow OK
 ☐ Alarm Horn

☒ V4 Open
 ☐ Channel 29

☒ V4 Closed
 ☐ Quick Cool

☒ Channel 07
 ☐ Lighttower Green

☐ Channel 08
 ☒ Channel 32

☐ Channel 09
 ☒ Channel 33

☐ Arc PS Enable
 ☒ Channel 34

☐ Vaporizer PS Enable
 ☒ Channel 35

☐ Filament PS Enable
 ☒ Channel 36

☐ Channel 13
 ☒ Channel 37

☐ RP1 On
 ☒ Channel 38

☐ RP1 Off
 ☒ Channel 39

☐ Lighttower Yellow
 ☒ Channel 40

☐ Lighttower Red
 ☒ Channel 41

☐ V6 Open
 ☒ Channel 42

☐ Emission PS Enable
 ☒ Channel 43

☐ V1 Open
 ☒ Channel 44

☐ V2 Open
 ☒ Channel 45

☐ V3 Open
 ☒ Channel 46

☐ V4 Open
 ☒ Channel 47

Main

Recipe

Service

Log

- **Source Integrity and Out-gassing** are the most important benefits of the Krytek.
 - There are often differences in source operation depending on the individual doing the rebuild.
 - Time is saved by replacing otherwise needed "in-situ" out-gassing and prevention of early or immediate failure of the source
 - The Krytek performs a quality control function for key parameters assuring improved repeatability of source operation.
- **Beam Purity:** Source cleaning materials leave long lasting residues in the arc chamber and other regions of the source. Unwanted materials include:
 - Various types of Scotch-brite and unapproved solvents
 - Bead-blast materials and residues - especially Sodium from blast beads
 - ... these can generate unwanted ions and unwanted molecular species. Disassociated ions can appear in the beam or close to the beam.
- Finally if a modern implanter with **Auto-tuning** has instability on source start-up it often can't be handled by the computer.