

# DO YOUR HERMETIC ENCLOSURES HAVE TOO MUCH WATER?

*AJA announces a new workshop on*

## HERMETICITY, MATERIALS OUTGASSING and MOISTURE CONTROL

For

Package Designers, Assembly and Production Engineers and  
Managers.

### HOW TO KEEP SEALED ENCLOSURES DRY!



# WHY THIS COURSE?

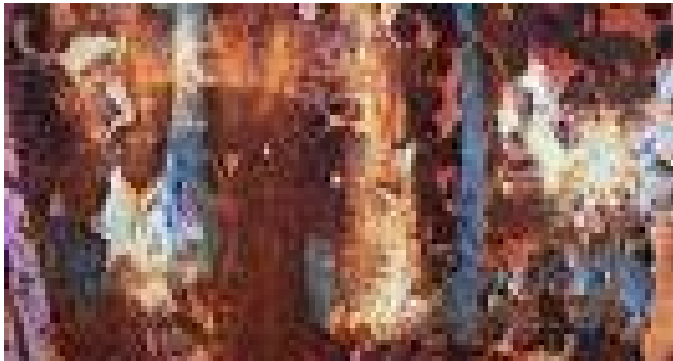
## ***MOISTURE IN ELECTRONIC ENCLOSURES IS BAD NEWS***

- **IN THE 1970's THE US WAS ON THE VERGE OF RECALLING ITS TRIDENT SUBMARINE FLEET BECAUSE OF CORROSION IN ONBOARD ICs.**
- **IN THE 1980's A SPACE SHUTTLE LAUNCH ABORTED ON THE PAD BECAUSE OF METALLIZATION CORROSION IN A SINGLE IC IN AN ONBOARD COMPUTER**
- **IN THE 1990's TELECOM DEVICES FAILED DUE TO FOGGING OF OPTICAL COMPONENTS**
- **IN THE 2000's MEDICAL DEVICES FAILED DUE TO COPIOUS AMOUNTS OF INTERNAL MOISTURE AND NANOMACHINES ARE STICKING DUE TO HIGH INTERNAL RELATIVE HUMIDITY**

**IN SHORT...**

# **MOISTURE-The ETERNAL And UBIQUITOUS CONTAMINANT: PLAGUING ELECTRONIC AND MICROMECHANICAL DEVICES SINCE THEIR INCEPTION BECAUSE...**

**Surfaces corrode**



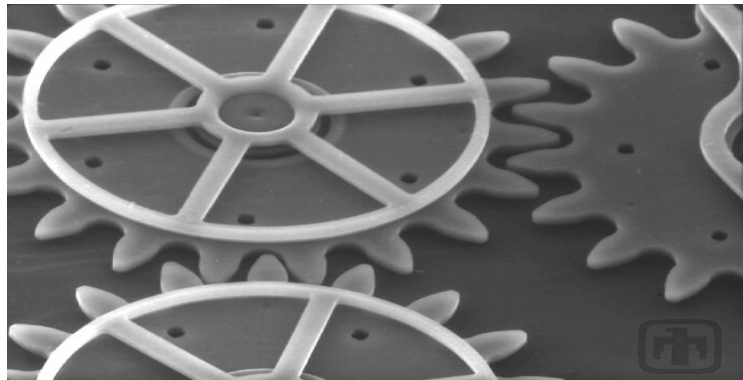
**Optics fog**



**Electrical currents leak**



**Nanomachines stick**



# THERE ARE ONLY TWO POSSIBLE SOURCES OF MOISTURE IN ELECTRONIC ENCLOSURES

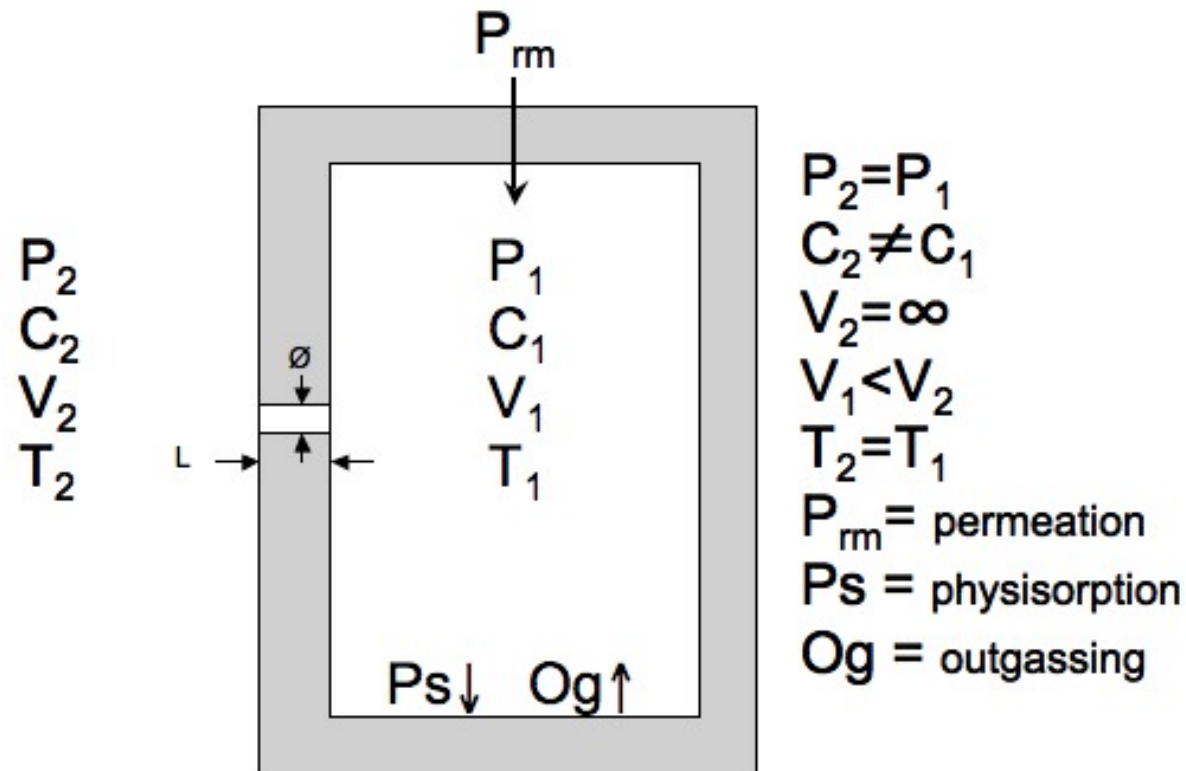
**MATERIALS  
OUTGASSING**



**INGRESS FROM  
OUTSIDE (LEAKS)**

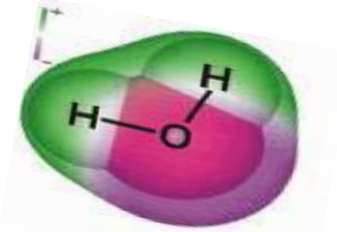
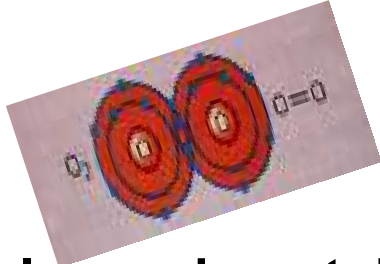


# OUR WORKSHOP EXPLAINS THE PHYSICS OF MOISTURE BEHAVIOR *DUE TO LEAKS AND MATERIALS OUTGASSING*

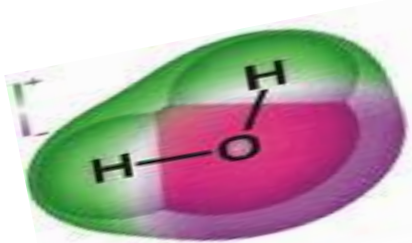


# THE WORKSHOP REVIEWS PACKAGE GAS CHEMICAL COMPOSITION

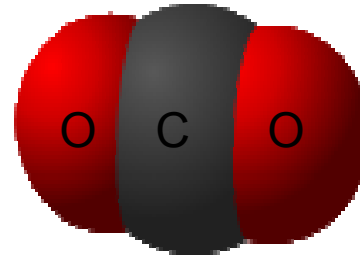
If an enclosure is wet due to air ingress via a leak, its internal gas composition will include:



If an enclosure is wet due to materials outgassing, the dominant volatile species will be the moisture, sometimes accompanied by:



plus



and/or



***Almost 9 out of 10 units noncompliant on moisture content (>0.5v% water vapor) uniquely contain water vapor without components of air, often with carbon dioxide and/or volatile organics.***



# THIS AJA WORKSHOP EMPOWERS YOU TO ELIMINATE MOISTURE AS A CONCERN IN HERMETIC ENCLOSURES

- **Understand the physics of moisture behavior in packages.**
- **See why leaks are an important, but secondary, concern.**
- **Select materials and execute robust processes to build and maintain enclosures dry.**
- **Assure sealed enclosures free of moisture and related failure mechanisms.**



# Contact Us

***And we will tailor a workshop for you to understand the sources and control of moisture in sealed enclosures.***

**(This and the moisture measurement workshop can be combined in a single dynamic workshop enhancing both your efficiency and efficacy of moisture measurement and control in sealed devices.)**

-----

**For more information and to discuss call:**

**Arthur Jonath at +1.650.851.8852**

**or**

**Email us about “MOISTURE”  
[info@jonathassociates.com](mailto:info@jonathassociates.com)**

**For other topical workshops and technical services visit**

**[www.jonathassociates.com](http://www.jonathassociates.com)**

