EAG LABORATORIES | WE KNOW HOW™

MATERIALS SCIENCES

HOW DO YOU COMPLY WITH <USP 232/233>? HOW DO YOU KNOW WHEN TO CONDUCT E/L STUDIES? HOW DO YOU FULLY CHA
ANTIBODY DRUG CONJUGATE? HOW DO YOU MONITOR CHARGE VARIANTS AND DEGRADATIONS? HOW DO YOU DETECT POST
MODIFICATIONS? HOW DO YOU RE-OPTIMIZE AN ELISA METHOD WHEN A REAGENT LOT CHANGES? HOW DO YOU IDENTIFY UN
METABOLITES? HOW DO YOU OPTIMIZE AN ANALYTICAL METHOD UNDER GMP? HOW DO YOU KNOW IF A BIOSIMILAR IS SIMILA
DO YOU KNOW RAW MATERIALS ARE PURE? HOW DO YOU EVALUATE PRODUCT PACKAGING? HOW DO YOU IDENTIFY THE SOU
CONTAMINATIO **HOW DO YOU DETERMINE THE INTERNAL GAS COMPOSITION OF AN ELECTRONIC COMPONENT?** TEST FOR TW
HOW DO YOU ADJUST A FORMULATION FOR TIMED RELEASE? HOW DO YOU MAKE A DRUG IS ABUSE-DETERRENT? HOW DO YO
A METHOD MORE ROBUST? HOW DO YOU ENSURE A LINKER WON'T BECOME TOXIC? HOW DO YOU GET A CLEARER SUPERNA
HOW DO YOU MONITOR ANALYTE CONCENTRATION OVER TIME? HOW DO YOU ADDRESS AN FDA RESPONSE LETTER ASAP? H
YOU KEEP UP WITH CHANGING REGULATIONS? HOW DO YOU PREDICT EFFECTS OF POST-TRANSLATIONAL MODIFICATIONS? H
YOU EVALUATE CONTAINER/CLOSURE SYSTEMS? HOW DO WE MAKE PACKAGING SAFER? HOW DO WE SPEED UP INNOVATION

Residual Gas Analysis (RGA)

DLA Laboratory Suitability for MIL-STD-883 and MIL-STD-750, Method 1018 Internal Water Vapor Content

Packages

DIP'S, Quad Packs, TO-x Cans, Metal Lidded Devices, Filler Gas Containers and many other geometries can be analyzed.

Volumes

0.01cc to 25cc volumes can be analyzed. Precision radiographic techniques are used to determine the volume of the package.

Analysis

All gases with molecular weights between 1 - 140 mass units can be identified with a survey scan, or up to 12 components can be preselected for quantitative analysis.

Gases Analyzes

Nitrogen, Oxygen, Argon, Carbon Dioxide, Moisture, Hydrogen, Helium, Fluorocarbons, Methane and Ammonia are normally measured and reported. Additional gases can be added to the list upon request.

The lifetime of electronic components follows a predictable trend. A significant number of components fail prematurely at a very early age ("infant mortality"). Once past this initial failure stage, they usually perform for a long period of time with a very low probability of failure.

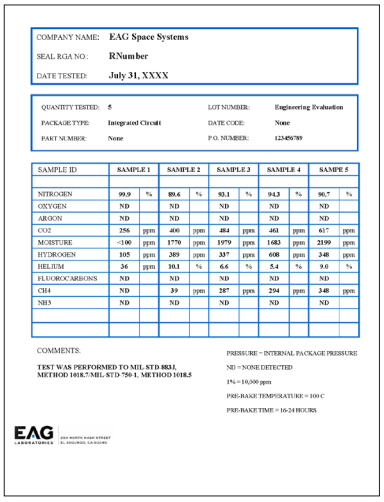
High reliability electronic components are often required to operate for long periods of time, having little or no opportunity for replacement. Orbiting satellites are good examples of this situation. Parts that meet the requirement for "space usage" are also used in applications where replacement is difficult and/or failure engenders great risk.

The infant mortality problem can be addressed by the implementation of stringent quality controls during manufacturing. SEM examination of metallization, glassivation analysis, thorough precap inspection, electrical burn-in and DPA procedures will identify the respective problems. Old age failures are usually related to either transient phenomena, such as ESD or EOS, mechanical shock, thermal excursions or chemical reactions, such as corrosion.

In order to eliminate failures caused by chemical reactions, the internal gas composition of the component must be known. MIL-STD-883, method 1018 and MIL-STD-750 are generally the accepted specifications for internal water vapor content. These methods define procedures for RGA equipment calibration and device testing, as well as the maximum acceptable limit for water vapor content.

RGA is useful for more than moisture content analysis. Because EAG Laboratories' RGA system can detect all masses up to 140 AMU, the common gases can be identified and quantified. Samples of process atmospheres and unusual sealing environments can be analyzed to detect the evolution or resorption of gases.

EAG's RGA system software can determine the moisture content, as well as analyze an entire spectrum of gases contained in the component. In addition to providing routine RGA data, the staff at EAG has the technical expertise to identify the origin of "problem" internal gases and provide corrective action to minimize outgassing and lower the moisture content within the devices.



COMPANY NAME: EAG Space Systems
SEAL RGA NO.: RNumber
DATE TESTED: July 31, XXXX

QUANTITY TESTED: 5 | LOT NUMBER: Engineering Evaluation
PACKAGE TYPE: Integrated Circuit | DATE CODE: None
PART NUMBER: None | P.O. NUMBER: 123456789

SAMPLE ID	SAMPLE 1		SAMPLE 2		SAMPLE 3		SAMPLE 4		SAMPLE 5	
NITROGEN	99.9	%	89.6	%	93.1	%	94.3	%	96.7	%
OXYGEN	ND		ND		ND		ND		ND	
ARGON	ND		ND		ND		ND		ND	
CO2	256	ppm	400	ppm	484	ppm	461	ppm	617	ppm
MOISTURE	<100	ppm	1770	ppm	1979	ppm	1683	ppm	2199	ppm
HYDROGEN	105	ppm	389	ppm	337	ppm	608	ppm	348	ppm
HELIUM	36	ppm	10.1	%	6.6	%	5.4	%	9.0	%
FLUOROCARBONS	ND		ND		ND		ND		ND	
CH4	ND		39	ppm	287	ppm	294	ppm	348	ppm
NH3	ND		ND		ND		ND		ND	

COMMENTS:
TEST WAS PERFORMED TO MIL STD 883.L METHOD 1018.7/MIL STD 750.1, METHOD 1018.5

PRESSURE = INTERNAL PACKAGE PRESSURE
ND = NONE DETECTED
1% = 10,000 ppm
PRE-BAKE TEMPERATURE = 100 C
PRE-BAKE TIME = 16-24 HOURS

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OTHER MIL-STD-883 TESTING AVAILABLE AT EAG:

- Destructive Physical Analysis (DPA)
- Failure Analysis
- Fine Leak/Gross Leak
- Die Shear
- Radiography
- SEM Inspection
- P.I.N.D. Testing
- Bond Pull Strength Test

EAG is a DLA (Defense Logistics Agency) approved laboratory

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