Naval and Military

Application Notes

The Lockheed C-5 Galaxy

Measurement Technique

1 Submarine Periscopes

Because of the nature of the dew point test used, fast hygrometer response is a key issue. Michell's Cermax Portable Dewpointmeter is an ideal instrument for this type of appliation.

2 Critical Shipboard Applications

Although some dehydrators have integral dew-point hygrometers, most navel vessels also require portable hygrometers for dew point checks at points of use.

3 Airborne Dry Gas Applications

The operation of the dehydrator must be periodically verified with a portable hygrometer (Cermax).

4 Missile Coolant Applications

The gas dew point is verified each time the missile is serviced prior to flight, using a portable hygrometer and sampling system.

5 Argon Welding

A large number of Cermet units have been put into service for this application.

Background

1 Submarine Periscopes

Modern submarine periscopes are internally purged and filled with dry inert gses (typically nitrogen) to prevent degradation of the internal components, and to prevent fogging of the optics in cold weather (especially arctic) operations. Navy repair facilities utilise dry gas sources to perform this purge and refill during maintenance operations. It is obviously critical to the combat readiness of the submarines to verify that the internal periscope gas dew point is sufficiently low, and thus accurate hygrometers are required.

2 Critical Shipboard Applications

Most modern naval (and commercial) seagoing vessels utilise compressed air dehydrators to provide dry air for numerous uses. High pressure air must be dry to prevent freeze up of values and components when the high pressure (typically 3000-5000 psig) air is expanded. Low pressure air must be dry to prevent condensation and resultant component damage. These uses include:

high pressure:	engine start air missile launch torpedo launch gun barrel clearing
low pressure:	engine controls electronics cooling

For both low and high pressure applications hygrometers are utilised to verify correct dehydration operation.

3 Airborne Dry Air Applications

Military aircraft ulitise compressed dry gases in numerous applications. One case is the fire suppression tanks on such transport aircraft as the Lockheed C-5. The fire suppression tanks are purged and filled with dry nitrogen, and the dew point must be verified to avoid valve and line freezing at high altitudes.

Another application is the dry gas used to purge radar waveguides. Typically small compressor dehygrator units are used to provide a low flow rate of dry air to prevent corona discharge within the waveguide.

4 Missile Coolant Applications

Air-to-air missile weapons systems utilise dry cryogenic inert gases to cool the infrared seeker head to a very low temperature. The compressed gas storage and delivery system must be maintained at a very low dew point to prevent freezing.

5 Argon Welding

All welding of aerospace components is performed within an inert gas atmosphere to maintain high purity of the weld and prevent strength-reducing inclusions and oxides. Typical blanketing gases include dry argon and argon/CO_2. The dew point of the welding gas is either continuously or periodically verified

MICHELL Instruments

The Dew Point Specialists

Michell Instruments Ltd
48 Lancaster Way Business Park
Ely, Cambs, CB6 3NW UK
Tel: +44 (0)1353 658000 Fax: +44 (0)1353 658199
e-mail: info@michell.co.uk
www.michell-instruments.com

Q6284 (UK) 0179 (UK)