

APPLICATION NOTE

# Heat Treating Furnace Dewpoint Application



**Featured Product**  
XTR-100

## Instrument: In-Line

### Description

Heat treating furnaces may be found in numerous industries. They are used by manufacturers of semiconductors, electronic parts, aircraft and aerospace components, metal products, glass products, ceramics and various types of hermetic seals. In a typical application, the product moves down a belt into the oven. Depending on the requirements one or more of the following gases may be present:  $N_2$ , Ar,  $O_2$ ,  $H_2$ . The dewpoint may range from ultra-dry (-100°F or lower) to wet (+68°F) and in rare situations possibly greater. The goal is to have a conditioning atmosphere which will enhance an effect on the product (i.e. formation of, or reduction of, an oxide layer, etc.)

**Problems**

Improperly treated materials may be structurally unsound, or prone to corrosion.

**Points to Consider**

Most heat treating is performed on metals, or metal products. Prior to treatment, they may have been welded or machined, then cleaned. Most cleaning and degreasing compounds contain chlorides. During heat treating these may be given off as  $Cl_2$ , HCL or CL – radicals. All are highly aggressive and will attack an aluminum oxide sensor. Also, the treating gases themselves may combine to form  $NH_3$  (if  $N_2$  and  $H_2$  are used) or they may combine with chemicals given off by the metals and degreasers to form other aggressive compounds. Heat treating is done at very high temperatures, possibly up to 2000°C. This temperature must be reduced to approximately 35°C (100°F) for sampling. Therefore, a cooling coil or length of tubing should be installed before the sample cell. 6' of 1/8" – 1/4" tubing should be sufficient. Also, due to the low pressures involved a vacuum pump may be required.

**Sensor Range(s)**

XTR-100 (-149 - +68°F)

or XTR-65 (-65 - +69°F)

**Contact Person(s)**

Manufacturing Engineer

Materials Engineer

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