

## What is CEIRS™ Technology for Measurement of Dew Points in Natural Gas

### KEY CONCEPTS

- CEIRS™ technology is essentially an advanced chilled-mirror .
- CEIRS™ Technology is far superior to other technologies for determination of dew points in natural gas
- Chilled-mirror measurements are a first-principle technique.
- CEIRS™ Technology is immune to contaminants and corrosives in natural gas.
- CEIRS™ Technology does not need calibration as it is a *first-principle* measurement.

### SUMMARY

ZEGAZ Instruments Chilled-mirror Evanescent Infra-Red Spectroscopy (CEIRS™) Technology is the most advanced technique for determination of dew points in natural gas. It is a novel combination of the Chilled-Mirror concept with Infra-Red spectroscopy to accurately and unambiguously determine hydrocarbon and water dew points in natural gas. This technical note addresses the measurement dew points (moisture and hydrocarbon dew points) in natural gas

### The Measurements

ZEGAZ Instruments Chilled-mirror Evanescent Infra-Red Spectroscopy (CEIRS™) is a **true dewpoint** measurement based on proprietary chilled-mirror technology combined with IR spectroscopy.

Conceptually, it is a chilled-mirror instrument. It is similar to a manual chilled-mirror, except that the refrigerant has been replaced with electronic coolers. More importantly, the human eye has been replaced with infrared sensing mechanism that can detect the dewpoint and whether it was water or hydrocarbon dewpoint. This eliminates the errors from the operator.

### Accuracy

ZEGAZ CEIRS™ Technology is a highly-accurate *first-principle* measurement of water dew point. This means that CEIRS™ actually measures the dew point directly. The accuracy in the short term and long-term is  $\pm 0.5$  °C.

### Long-Term Reliability

The only wetted part in CEIRS™ Technology is an extremely inert glass-like substance. It is immune to all contaminants, even strong acids and bases. No foreign substances can permanently bond to it, nor degrade it.

### Measurement Under Pressure

ZEGAZ CEIRS™ Technology will perform the measurement at line pressure, up to 137 bars (2000 psi). **Therefore the dewpoint measured is the actual dewpoint at that pressure.**

### Immunity to Contaminants in Gas Phase

Since the IR beam does not travel through the gas phase in CERIRS™, contaminants that may be present in the gas phase, will not affect the measurement.

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