Moisture and water damage is a well-known problem in construction in many countries. Already in the 80's there were reported 10,000 housing units in Canada, which had moisture problems serious enough to cause a financial loss. This issue of Vaisala News provides some topical information on construction humidity issues. We have been fortunate in receiving a number of interesting articles on this subject from specialists working in the field.

Wide-Ranging Construction Humidity Measurement Studies

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For example, one article on insurance claims in Finland explains the causes of water damages and the importance of moisture penetration prevention. Vaisala cooperates closely with international drying companies such as Munters. Our aim is to get as much field information as possible, in order to develop new generation instruments.

Another article from Japan describes advanced studies on construction materials and the impact of air conditioning in this country. It reports research results which show that humidity has a direct impact on indoor air quality.

Focus on humidity problems

The fact that construction problems and excessive water and humidity often go together is well-known around the world today.

In Finland, for example, 80–90 per cent of all construction problems are caused by humidity, and 50 per cent of all buildings have some kind of moisture-related problems. This percentage includes both small and big problems. In Sweden, 10–30 per cent of all property is affected by humidity problems which should be repaired immediately. In the USA, 90 per cent of all construction problems are associated with water in some way.

Growing awareness of percentages such as these has led to greater attention being paid to construction humidity and its measurement throughout the world in recent years. Scandinavian countries have taken an active role in research.

Construction humidity can be caused by a variety of reasons. Too tight project schedules,

The thin HMP42 probe is ideal for humidity measurements in confined spaces.

The 'Merikannonranta' is a construction research site in Helsinki where structural humidity measurements were studied at a built-in-site seven story residential building. Vaisala's HM44 moisture probes were used to monitor the moisture content of the structures throughout the construction process.

which do not allow the concrete to dry properly before laying carpet, are one of the reasons for construction humidity. Also the type of construction details used in assembly of the building envelope can be a cause for construction humidity problems. Later on, if maintenance is neglected, there may also be failures in water pipes.

Weather plays an important role, and moisture problems caused by rain penetration and tropical storms are well-known.

Advanced measurement technology available

Vaisala has been manufacturing construction humidity instruments for several years. Vaisala's special HM44 kit for concrete moisture measurements has gained a lot of interest in the world. Concrete dries unevenly, and its surface measurement alone may give misleading information. The HM44's plastic sleeves and probes enable measurements to be made at the correct depth to give a true picture of the concrete's dryness. Is the concrete floor dry enough, for example, to lay carpet, tiles, flooring, etc?

Only 4 mm (0.16") in diameter, Vaisala's HMP42 probe – a new member of the construction humidity measurement family – was released about one year ago. It is an ideal choice for construction moisture detection. This remarkably thin probe is designed and optimized for measurements in structures and confined places.

The replaceable filter of the high performance sensor prevents it from being affected by dust and particles which are common on construction sites. In addition, HMP42 can be used to measure humidity and temperature in air conditioning channels.

Versatile indicator for humidity probes

The HMP42 and HMP44 construction humidity probes use the same indicator. The HMI41 indicator has an easy-to-read, two-line, liquid crystal display in user-selectable metric or non-metric units. In addition to displaying the humidity and temperature readout, the HMI41 indicator calculates dewpoint and wet bulb temperatures, absolute humidity and mixing ratio. The collected measurement data can also be transferred to a PC. ■

The versatile HMI41 indicator (in the left, pictured with different humidity probes) has an easy-to-read two line liquid crystal display with user selectable metric or non-metric units.