

DIN EN 16242:2013-03 (E)

Conservation of cultural heritage - Procedures and instruments for measuring humidity in the air and moisture exchanges between air and cultural property

Contents		Page
Foreword		3
Introduction		4
1	Scope	5
2	Normative references	5
3	Terms and definitions	5
4	Quantities characterising humidity in air	8
4.1	General	8
4.2	Relative humidity	9
4.3	The humidity mixing ratio	9
4.4	Absolute humidity	9
4.5	Dew-point temperature	9
5	Considerations and recommendations related to measuring methods	9
5.1	Considerations	9
5.2	Recommendations	10
6	Main features of the hygrometers	11
6.1	Chilled-mirror dew-point hygrometer	11
6.2	Electronic psychrometer	12
6.3	Electronic hygrometer with a capacitive sensor	13
6.4	Electronic hygrometer with a resistive sensor	13
6.5	Hair hygrometer/hygrograph	14
7	Instrument calibration	14
Annex A (informative)	Formulae for calculating relative humidity and related variables	16
A.1	Instruments: Psychrometer, barometer - Parameters: air temperature t ($^{\circ}\text{C}$), wet bulb air temperature t_w ($^{\circ}\text{C}$), p (hPa)	16
A.2	Instruments: RH hygrometer, thermometer, barometer - Parameters: t , RH, p	17
A.3	Instruments: Dew-point hygrometer, thermometer, barometer - Parameters: t , t_d , p	18
Annex B (informative)	Examples for indoor climate measurements	19
B.1	Recognising the penetration and spread of external air across a room	19
B.2	Recognising if wall dampness is associated to condensation or evaporation	20
B.3	External dampness entering a room shown with a mixing ratio plot	20
Annex C (informative)	Instrumental errors	22
C.1	Psychrometer: errors in the various hygrometric variables generated by an error of 0,1 $^{\circ}\text{C}$ in a temperature reading	22
C.2	Psychrometer: error in determining the relative humidity due to pressure change	23
C.3	Error due to a thermal inertia of a case, a probe or a shield	23
C.4	Typical non-linearity and hysteresis of the hair hygrometer	24
C.4.1	Hair non-linearity and hysteresis	24

C.4.2	Linear and non-linear scales	25
	Bibliography	28