

COLD-END COMPENSATOR FOR THERMOCOUPLES.¹

BY CHARLES B. THWING.

THE method of compensating for variations in the temperature of the cold ends of a thermocouple used in connection with a direct reading indicator or recorder consists in placing in series with the couple at the cold end a Wheatstone bridge of low resistance. Three arms of the bridge are of manganin, the fourth of nickel. The current through the bridge is so adjusted by resistance in the battery circuit as to give direct readings of temperature at the bridge when the thermocouple is not in circuit. When couple and bridge are connected in series the readings of bridge and thermocouple are combined to give true temperature readings. Otherwise expressed, the bridge automatically sets the zero of the indicator to cold end temperature. (The apparatus was exhibited, attached to a recording pyrometer.)

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THE EMISSIVITY OF METALS AND OXIDES. I: NICKEL OXIDE (NiO) IN THE RANGE 600 TO 1300° C.¹

BY G. K. BURGESS AND P. D. FOOTE.

THE monochromatic emissivity, E_λ , throughout the visible spectrum and the total emissivity, E , of nickel oxide (NiO) have been measured for the temperature interval 600 to 1300° C. The monochromatic emissivity increases linearly with increasing wave-length and decreases linearly with increasing temperature over the region investigated. For example, at 1160° C., E_λ increases from 0.865 at 0.5 μ to 0.882 at 0.7 μ , and for $\lambda = 0.65 \mu$, E_λ decreases from 0.958 at 800° C. to 0.845 at 1300° C. The total emissivity increases with increasing temperature, but the relation is not linear. Temperatures and E have respectively values as follows: 600°, 0.54; 800°, 0.68; 1000°, 0.76; 1200°, 0.85; 1300°, 0.87.

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SOME EFFECTS OF DIFFRACTION ON BRIGHTNESS MEASUREMENTS MADE WITH THE HOLBORN-KURLBAUM OPTICAL PYROMETER.¹

BY A. G. WORTHING AND W. E. FORSYTHE.

IT has generally been assumed that, when the pyrometer filament in a Holborn-Kurlbaum optical pyrometer apparently matched the background image in brightness, the filament and the image were at the same brightness. However, in attempting to compare temperature measurements on a tungsten filament made with an ordinary Holborn-Kurlbaum optical pyrometer with those made with a modified one as described below, such was found not to be the case.

¹ Abstract of a paper presented at the Washington meeting of the Physical Society, April 24-25, 1914.