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Calories Required to Heat Iron

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CORRESPONDENCE AND DISCUSSION

Calories Required to Heat Iron

The communication of Major Stassano in your issue of recent date contains information of value to those interested in the electro-metallurgy of iron and steel, a subject of rapidly increasing importance. For this reason, therefore, if for no other, attention ought to be called to the fact that the curve of heat content in steel, on page 1137 is totally misleading from the melting point of iron up to 2000 deg.

The heat in iron at 1900 deg. is undoubtedly about 450 calories, and at 1600 deg., the melting point, 300 calories, when unmelted, but about 370 calories, at 1600 deg., when melted. The curve errs therefore, in totally ignoring the latent heat of fusion, which has never been experimentally determined, but which the writer has calculated by two different thermochemical principles to be 69 or 70 calories; it also errs in taking the specific heat of

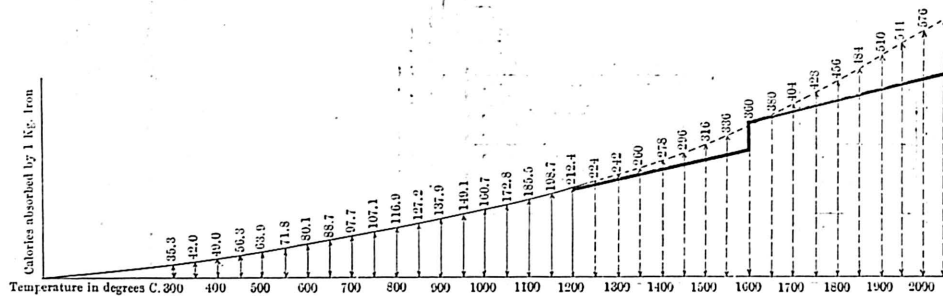


DIAGRAM SHOWING THE NUMBER OF CALORIES REQUIRED TO HEAT IRON TO DIFFERENT TEMPERATURES

liquid iron as about 0.44 when in all probability it is 0.22. The comparison of the curve as it is, and as it should be, are about as shown in the accompanying diagram.

The question of the specific heat in the melted state not being the very high quantity—0.44—used by Stassano is of immense importance in those thermo-electric processes which receive melted steel and simply raise its temperature and keep it fluid while under treatment. The fact that some 70 calories is absorbed as latent heat in melting pure iron, at 1600 deg., is also of great significance as a thermo-electric consideration, because this amount of heat, if not disappearing as latent heat, would raise the temperature of the iron some 300 deg. Centigrade.

JOSEPH W. RICHARDS.

Lehigh University, June 15, 1907.