

EFFECT OF SUBATMOSPHERIC TEMPERATURES ON THE PROPERTIES OF METALS

(PROJECT No. 13)

The technical literature contains much information on the physical properties determined at atmospheric temperatures of numerous metals used in engineering. The testing of metals at either sub-atmospheric temperatures or at temperatures considerably above atmospheric temperatures brings in a number of factors which are not normally present in ordinary testing. The Joint Research Committee of the A.S.T.M.-A.S.M.E. on the Effect of Temperature on the Properties of Metals was organized to acquaint engineers with the effect of such factors on the results which might be expected when temperatures of testing depart from normal. It was realized that during a period of years a large amount of unpublished data had accumulated in laboratories and that the gathering of these data together in one publication would serve an excellent purpose. There was a demand for such a compilation. This was at first satisfied with the collection of results of tests at elevated temperatures which was published in a volume on "Creep Data" in 1938. More recently the same sort of undertaking having to do with the effect of subatmospheric temperatures was assigned as Project No. 13 to a subcommittee of the Joint Research Committee. War conditions abroad have interfered with the obtaining of results from foreign laboratories, but data were requested from 70 or more possible sources in the United States. Useful information, largely notched-bar impact test results, was furnished by 14 of these sources and this information was turned over to Dr. H. W. Gillett, a

member of the committee, who in the following report has not only classified it but has added to it a large amount of material from the literature, principally foreign, supplied critical comment, and appended a comprehensive bibliography bearing on the subject.

Unpublished information or amplification of previously published information was received from:

Alan Wood Steel Co.
American Locomotive Co.
Bethlehem Steel Co.
Climax Molybdenum Co.
Crane Co.
Dodge Steel Co.
Great Lakes Steel Corp.
Inland Steel Co.
International Nickel Co.
Midvale Co.
M. W. Kellogg Co.
National Bureau of Standards (work for Navy)
National Tube Co.
Otis Steel Co.
Standard Oil Development Co.
Texas Co.
Timken Roller Bearing Co., Steel and Tube Division
U. S. Steel Corp.
Union Carbide and Carbon Research Labs.
University of Illinois
Vanadium Corporation of America
War Department, Air Corp, Wright Field

This compilation by Dr. Gillett thus constitutes a report to the Joint Research Committee by its subcommittee on Project No. 13 having to do with the available data on the effect of sub-atmospheric temperatures on the properties of metals.

Respectfully submitted on behalf of
Project No. 13,

FRANCIS B. FOLEY,
Chairman.