## COMPARISON OF THE PROPERTIES OF BASIC OXYGEN AND OPEN HEARTH STEELS



Published by the AMERICAN SOCIETY FOR TESTING AND MATERIALS 1916 Race St., Philadelphia 3, Pa.

ASTM Special Technical Publication No. 364

## COMPARISON OF THE PROPERTIES OF BASIC OXYGEN AND OPEN HEARTH STEELS

## AMERICAN SOCIETY FOR TESTING AND MATERIALS



Reg. U. S. Pat. Off.

ASTM Special Technical Publication No. 364

Price \$1.50; to Members \$1.00

Published by the AMERICAN SOCIETY FOR TESTING AND MATERIALS 1916 Race St., Philadelphia 3, Pa. © BY AMERICAN SOCIETY FOR TESTING AND MATERIALS 1963 Library of Congress Catalog Card Number: 63-23427

NOTE—The Society is not responsible, as a body, for the statements and opinions advanced in this publication.

> Printed in Baltimore, Md. January, 1964

## CONTENTS

PA	GE
Introduction	1
Project A, ASTM A 285, Grade C	
<ul> <li>Table 1—Chemical Analysis; Bend, Tensile, and Homogeneity Test Results; and Selected Impact Properties in Longitudinal and Transverse Directions; Thickness:</li> <li><sup>3</sup>/<sub>16</sub> In.</li> <li>Table 2—Chemical Analysis; Bend, Tensile, and Homogeneity Test Results; and Selected Impact Properties in Longitudinal and Transverse Directions; Thickness:</li> </ul>	7
<ul> <li><sup>3</sup>/<sub>4</sub> In</li> <li>Table 3—Chemical Analysis; Bend, Tensile, and Homogeneity Test Results; and Selected Impact Properties in Longitudinal and Transverse Directions; Thickness: 1<sup>1</sup>/<sub>4</sub> In.</li> </ul>	8 9
Table 4—Chemical Analysis; Bend, Tensile, and Homogeneity Test Results; and Se- lected Impact Properties in Longitudinal and Transverse Directions; Thickness: 2 In.	10
	12
Table 6—Short-Time Elevated-Temperature (70 to 1000 F) Tensile Properties of Basic Oxygen and Open Hearth Furnace Steels	16
Open Hearth Furnace Steels	16 16
Figure 1—Comparison of Impact Properties of Basic Oxygen and Open Hearth Steels.       17,         Figure 2—Homogeneity Tests (ASTM A 285, Grade C, Firebox).       17,	18 19
Project C, ASTM A 442, Grades 55 and 70	
Table 9Chemical Analysis; Bend, Tensile, and Homogeneity Test Results; and Se-	

Table 9-Chemical Analysis; bend, Tensne, and Homogeneity Test Results; and Se-	
lected Impact Properties in Longitudinal and Transverse Directions	23
Table 10-Mechanical Properties in the Normalized and Stress-Relieved Condition.	24
Table 11-Short-Time Elevated-Temperature (Room Temperature to 1000 F) Tensile	
Open Hearth and Basic Oxygen Steels	25
Table 12-Effect of Strain Aging on Tensile and Impact Properties	26
Table 13-Comparison of Weldability Characteristics of Open Hearth and Basic Oxy-	
	26
Figure 3-Comparison of Impact Properties of Basic Oxygen and Open Hearth Steels,	
(ASTM A 442, Grade 55)	27
Figure 4-Impact Properties of Basic Oxygen (ASTM A 442, Grade 70) Steel	28
Figure 5-Homogeneity Tests: 1-in. Plate (ASTM A 442)	28
Figure 6-Comparison of Basic Oxygen and Open Hearth, As-Rolled, Ferritic Grain	
Structure, (ASTM A 442, Grade 55)	29
Figure 7-Comparison of Basic Oxygen and Open Hearth, Normalized, and Stress Re-	
	29
Figure 8-McQuaid-Ehn Austenitic Grain Structure (ASTM A 442, Grade 70)	
Figure 9-Ferritic Grain Structure of Basic Oxygen (ASTM A 442, Grade 70)	30

THIS PUBLICATION is one of many issued by the American Society for Testing and Materials in connection with its work of promoting knowledge of the properties of materials and developing standard specifications and tests for materials. Much of the data result from the voluntary contributions of many of the country's leading technical authorities from industry, scientific agencies, and government.

Over the years the Society has published many technical symposiums, reports, and special books. These may consist of a series of technical papers, reports by the ASTM technical committees, or compilations of data developed in special Society groups with many organizations cooperating. A list of ASTM publications and information on the work of the Society will be furnished on request.