

American Society for Testing Materials.

ASTM
VISCOSITY TABLES
for

KINEMATIC VISCOSITY CONVERSIONS AND
VISCOSITY INDEX CALCULATIONS



Reg. U.S. Pat. Off.

SEPTEMBER, 1957

ASTM Special Technical Publication No. 43-B

Price \$2.00; to Members, \$1.50

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

Nothing contained in any publication of the American Society for Testing Materials is to be construed as granting any right, by implication or otherwise, for manufacture, sale, or use in connection with any method, apparatus, or product covered by Letters Patent, nor as insuring anyone against liability for infringement of Letters Patent.

COPYRIGHT, 1957
BY THE
AMERICAN SOCIETY FOR TESTING MATERIALS

Printed in Baltimore, U.S.A.
September, 1957

CONTENTS

| | PAGE |
|---|------|
| Foreword..... | v |
| Table I. Conversion of Kinematic Viscosity to Saybolt Universal Viscosity..... | 1 |
| Table II. Conversion of Kinematic Viscosity to Saybolt Furol Viscosity..... | 19 |
| Table III. Basic Values for Calculating Viscosity Index from Kinematic Viscosity..... | 29 |
| Table IV. Values for Calculating Viscosity Index from Saybolt Universal Viscosity..... | 49 |
| Table V. Factors for Converting Kinematic Viscosity to Saybolt Universal Viscosity at Temperatures from -100 to +500 F..... | 57 |

FOREWORD

This collection of ASTM Viscosity Tables for Kinematic Viscosity Conversions and Viscosity Index Calculations was prepared by Section A of Research Division VII on Flow Properties, of ASTM Committee D-2 on Petroleum Products and Lubricants. The five tables included provide a convenient means for viscosity conversions and for obtaining basic values for calculations of Viscosity Index.

With the adoption of 1.0038 cs at 68 F as the standard value for the kinematic viscosity of water¹ on July 1, 1953, recalibration of viscometers used for measuring kinematic viscosity was required. This resulted in a reduction of 0.318 per cent in the kinematic viscosity of a given product. Saybolt viscometers are not calibrated with water and were not affected. Therefore, all conversion tables listing kinematic and Saybolt viscosity values required revision. In addition, as Viscosity Index can be calculated with both kinematic viscosity and Saybolt viscosity results, the basic values for calculating Viscosity Index from kinematic viscosity required revision.

While preparing the revisions to the tables it was found to be desirable to expand and extend them. The five tables included are based upon the following ASTM standards:²

| ASTM Designation | Title |
|------------------|--|
| D 446 | Standard Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity |
| D 666 | Standard Method for Conversion of Kinematic Viscosity to Saybolt Furol Viscosity |
| D 567 | Standard Method for Calculating Viscosity Index |

For convenience in converting kinematic viscosities to Saybolt Universal viscosities at temperatures other than 100 F and 210 F, factors are given in Table V for conversions in the temperature range of -100 to +500 F. These factors are derived from the general equations given in ASTM Standard D 446.

¹ J. F. Swindells, J. R. Coe, Jr., and T. B. Godfrey, "Absolute Viscosity of Water at 20° C," *Journal of Research, Nat. Bureau Standards*, Vol. 48, No. 1, January, 1952 (*Research Paper R.P. 2279*).

² 1955 Book of ASTM Standards, Part 5.

