

# **Knocking Characteristics of Pure Hydrocarbons**

**Developed Under  
American Petroleum Institute Research Project 45**



**Published by the  
American Society for Testing Materials  
1916 Race St., Philadelphia 3, Pa.**

*ASTM Special Technical Publication No. 225*



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*Reg. U.S. Pat. Off.*

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# KNOCKING CHARACTERISTICS OF PURE HYDROCARBONS

## Foreword

This publication is being issued to make generally available the data on the knocking characteristics of pure hydrocarbons that have been developed under the American Petroleum Institute Research Project 45. While this information was developed primarily for the API Project, the usefulness of the data would be expanded by its broader distribution. To this end, the ASTM Committee D-2 on Petroleum Products and Lubricants was selected as the agency best suited to sponsor this distribution, as it is largely composed of engine manufacturers, petroleum refiners, and consumers.

The project has been a very extensive undertaking and has entailed a considerable amount of research work carried out at the Ohio State University in the preparation of the hydrocarbons and at several research organizations equipped with engines to measure the knocking characteristics of the hydrocarbons. The general supervision of the project was under Prof. C. E. Boord of the Ohio State University.

The objective of the project was to obtain samples of a wide variety of pure hydrocarbons and to relate their structures and physical characteristics with their respective knock limitations in engines. A variety of engine types and operation procedures were selected for this investigation because of the important effect of these variables on knock ratings of the

hydrocarbons. The data were made available currently in annual reports distributed through the API. In preparing the present publication, these data have all been checked against original sources, in order to present them as free from error as possible.

The data are presented in three sections according to the test method employed:

- I. The ASTM Research and Motor Methods
- II. The Critical Compression Ratio Method
- III. The 17.6 Supercharged Method

A history of the API Project and a discussion of the significance of the data appear elsewhere in this publication. A special Editorial Committee composed of representatives from API Project 45 and ASTM Committee D-2 prepared this publication. Copies may be obtained from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Respectfully submitted on behalf of the Editorial Committee,

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