INTRODUCTION

By R. E. Hatton[1]

Interest in and use of fire resistant fluids and lubricants has increased rapidly in recent years. Many questions have arisen concerning such subjects as the meaning of fire resistance, the methods of assessing fire resistance, the relation of test data to actual hazards in use and the interrelations between test methods. The purposes of this symposium were to make available current data and philosophical thought on these subjects through presentation of papers by those active in fire resistant fluid and lubricant development and use. This information should be invaluable to those charged with system design, fluid selection, and study of fire hazards in a wide range of industry - from the depths of the sea to the wide reaches of space.

A major reason for this symposium is the widespread differences of opinion that appear between those active in developing and using fire resistant fluids. Tests for measuring fire resistance have been developed by a number of groups, the majority of tests being designed to simulate actual applications. Relations between such simulative tests and interpretation of data in terms of fundamental combustion phenomena have been largely ignored. However, use of such empirical simulative tests has resulted in fluids and lubricants which have demonstrated reduced fire incidence in actual applications.

For example, aircraft fire resistant hydraulic fluids were developed to meet aircraft industry requirements, described in a specification (AMS 3150) written by representatives of the aircraft industry. Fire tests in this specification were simulative in nature and reflected a philosophy that fire resistance should be determined under simulative conditions and that results from a number of tests must be taken together in order to determine fire resistance. Since all materials will burn under some conditions, and utility requirements limit fluid selection, a degree of fire resistance and not fireproofness or nonflammability is usually obtained. The tests of this specification

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were used to guide the development of fluids which have shown their utility and safety in aircraft use.

It should be noted that there exists a large number of proposed fire resitance tests which have been developed over a number of years and are designed to simulate certain conditions. As new conditions arise, new tests will be developed to simulate these new hazards. Efforts should be devoted to analyzing hazards and reducing them to as simple and fundamental parameters as possible. Standardizing groups and committee activities can provide a real service in helping the user by providing good methods for comparing products and in defining hazards.

This symposium was quite successful and has already generated a considerable amount of discussion. It is the purpose of this Special Technical Publication to record for future study, and as the basis for further discussion, test methods for determining fire resistance and the philisophies, opinions and ideas which led to their development.