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Standard Guide for Testing Automotive/Industrial Composite Materials¹

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€¹ NOTE—Section 13 was added editorially in June 1995.

INTRODUCTION

A new class of composite materials has been developed to meet the needs of automotive and industrial mass production applications. This new class of materials, referred to as automotive/industrial composites, is comprised of filled and unfilled polymers reinforced with chopped or continuous high modulus, or both, (greater than 20.7 GPa (3×10^6 psi)) fibers.

Automotive/industrial composites possess some of the same advantages as high-performance aerospace composites. However, some aspects of performance are traded off for reduced cost, ease of manufacturing, and high quality appearance. Automotive/industrial composites are also different from materials classified as plastics. This difference arises from the use of high modulus fiber reinforcement to provide substantial improvements in structural properties of the base polymer system.

Currently, ASTM standard test methods developed for high performance composites or plastics, or both, are used for testing of automotive/industrial composites. In many cases, these standards are quite adequate if proper attention is given to the special testing considerations for automotive/industrial composites covered in this guide. However, in some cases current standards do not meet the needs for testing of the required properties. In this case, revised standards or new standards specifically for automotive/industrial composites may be desirable.

In addition to covering the special considerations required for automotive/industrial composites testing, this guide points out and compares existing ASTM standards applicable to these materials. This is done only for some of the more commonly evaluated material properties.

1. Scope

1.1 This guide covers the testing of molded automotive/industrial composite materials. It is intended to increase the users awareness of the special considerations necessary for the testing of these materials. In addition, the user is provided with a comparison of some of the more commonly used ASTM standard test methods that are applicable for evaluating automotive/industrial composites.

1.2 Areas where current ASTM standard test methods do not meet the needs for testing of automotive/industrial composites are indicated. This provides direction for future standardization work.

1.3 It is not the intent of this guide to cover all test methods which could possibly be used for automotive/industrial composites. Only the most commonly used and most applicable standards are included.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

- C 581 Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service²
- D 256 Test Methods for Impact Resistance of Plastics and Electrical Insulating Materials³
- D 543 Test Method for Resistance of Plastics to Chemical Reagents³
- D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing³
- D 638 Test Method for Tensile Properties of Plastics³
- D 648 Test Method for Deflection Temperature of Plastics Under Flexural Load³
- D 671 Test Method for Flexural Fatigue of Plastics by Constant-Amplitude-of-Force³

¹ This guide is under the jurisdiction of ASTM Committee D-30 on High Modulus Fibers and Their Composites and is the direct responsibility of Subcommittee D30.03 on Automotive/Industrial Composites.

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² Annual Book of ASTM Standards, Vol 08.04.

³ Annual Book of ASTM Standards, Vol 08.01.