



Standard Test Method for Surrogate Testing of Vehicle Impact Protective Devices at Low Speeds¹

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INTRODUCTION

City and county governments are beginning to adopt legislation intended to reduce the increasing number of vehicle-into-building impacts. Typically, these ordinances are enforced as part of zoning laws, which require a protective device to be installed to protect pedestrians and storefront property where nose-in or head-in parking is present. For instance, in July 2012, The County of Miami Dade Florida adopted a zoning amendment requiring protective devices be installed to protect pedestrian traffic on sidewalks and inside storefronts for all new commercial construction. Examples of ways these protective devices might be deployed otherwise include the protection of patrons at bus stops; storefronts of commercial entities where parking or the direction of traffic flow are perpendicular to the building; restaurant patios bordering the street or on a sidewalk; and these protective devices could be used to protect propane tanks, gas pumps, and other hazardous materials to promote public safety.

As the demand for vehicle impact protection devices increases, the ability to evaluate whether each protective device performs as intended to protect the people, area, or asset is required. Guidelines have been developed previously to test vehicle protective devices by applying a static load at a particular location on the protective device. For instance, the State Fire Marshal Division of the Minnesota State Department of Public Safety has issued an “Aboveground Storage Tank Plan” that discusses how to install above ground storage tanks. Section 3.8.1 states if a physical barrier is to be used to protect the storage tank, it “shall be a minimum of 36 inches in height and shall resist a force of 12 000 pounds applied 36 inches above the adjacent ground surface.” While such static test methods are beneficial in certain instances, the performance of a protective device when impacted dynamically cannot be conclusively predicted using such a test method.

Test Methods have been developed previously that provide for a range of impact conditions, designations, and penetration performance ratings for vehicles traveling at high speeds. Test Method **F2656** provides for high speed impact speeds of 65, 80, and 100 km/h [40, 50, and 60 mph]. However, no ASTM test method has been formally developed to quantify the dynamic performance of a vehicle protective device at speeds of 50 km/h [30 mph] and lower.

1. Scope

1.1 This test method provides a range of impact speeds to be used with a 22 250-N [5000 lb] surrogate test vehicle. This test method establishes a range for penetration performance ratings. End users will be responsible for identifying the appropriate vehicle impact speed and penetration performance ratings in this test method to satisfy their specific needs.

1.1.1 In addition, end users may assign certification ratings for vehicle protective devices based on the test methodologies

described herein. Test parameters are standardized to arrive at a common vehicle weight, enhance test realism and replication, and produce uniform rating designations.

1.2 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

1.3 *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.*

¹ This test method is under the jurisdiction of ASTM Committee F12 on Security Systems and Equipment and is the direct responsibility of Subcommittee F12.10 on Systems Products and Services.

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