



Designation: E2831/E2831M – 11 (Reapproved 2018)

## Standard Guide for Deployment of Blast Resistant Trash Receptacles in Crowded Places<sup>1</sup>

This standard is issued under the fixed designation E2831/E2831M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This guide identifies the key factors that should be considered prior to the deployment of blast resistant trash receptacles (BRTRs) in crowded places.

1.1.1 Guidance is included for their deployment at interior and exterior locations associated with the crowded places.

1.2 Facilities and venues where blast resistant trash receptacles may be deployed include, but are not limited to:

- 1.2.1 Airports,
- 1.2.2 Banks and other financial institutions,
- 1.2.3 Bars and nightclubs,
- 1.2.4 Convention centers,
- 1.2.5 Entertainment and event centers,
- 1.2.6 Hotels,
- 1.2.7 Health care locations,
- 1.2.8 Museums,
- 1.2.9 Places of worship,
- 1.2.10 Public government locations including fire and police stations,
- 1.2.11 Railway stations, bus stations, and related transit areas,
- 1.2.12 Restaurants,
- 1.2.13 Retail centers and malls,
- 1.2.14 Schools, universities, and related areas used for education,
- 1.2.15 Stadiums and arenas, and
- 1.2.16 Theaters.

1.3 Guidance on conducting a threat assessment or vulnerability analysis, and on responding to incidents associated with the deployment of blast resistant trash receptacles is beyond the scope of this document.

1.4 *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.

<sup>1</sup> This guide is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.08 on Operational Equipment.

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Combining values from the two systems may result in non-conformance with the standard.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

- D638 Test Method for Tensile Properties of Plastics
- D747 Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam
- D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D882 Test Method for Tensile Properties of Thin Plastic Sheeting
- E2740 Specification for Trash Receptacles Subjected to Blast Resistance Testing

2.2 *Government Standards*:

- DoD 4145.26 M Department of Defense: DOD Contractors Safety Manual for Ammunition and Explosives<sup>3</sup>
- DoD 6055.9 STD Department of Defense: DOD Ammunition and Explosives Safety Standards<sup>4</sup>

2.3 *Association Standard*:

- APTA SS-SIS-RP-001-08 Recommended Practice for Trash/ Recycling Container Placement to Mitigate the Effects of

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from the Defense Technical Information Center, 8725 John J. Kingman Road, Suite 0944, Ft. Belvoir, VA 22060 6128.

<sup>4</sup> Available from the worldwide web at: <http://www.ddesb.pentagon.mil/DoD6055.9-STD%205%20Oct%202004.pdf>.

an Explosive Event<sup>5</sup>

### 3. Terminology

3.1 For terminology generally associated with explosives, refer to the glossaries given in DoD 4145.26 M and DoD 6055.9 STD.

3.1.1 Some of the definitions in this standard (3.2) are either adopted as exact copies, or are adapted, from DoD 4145.26 M. Where adapted, changes to the DoD definitions were made only to clarify the meaning or to incorporate related terms that also are defined in this terminology section.

3.1.2 The DoD source is identified at the right margin following the definition. In addition, in cases where definitions have been re-printed from standards developed by technical committees other than E54, the ASTM source is also identified at the right margin following the definition.

#### 3.2 Definitions:

3.2.1 *explosion, n*—chemical reaction of any chemical compound (or mechanical mixture) that, when initiated, undergoes a very rapid combustion or decomposition releasing large volumes of highly heated gases that exert pressure on the surrounding medium.

3.2.2 *explosive, n*—any chemical compound (or mechanical mixture) that, when subjected to heat, impact, friction, detonation, or other suitable initiation, undergoes a very rapid chemical change with the evolution of large volumes of highly heated gases that exert pressures in the surrounding medium.

**DoD 4145.26 M**

3.2.3 *fireball, n*—a highly luminous, intensely hot cloud of dust, gas, or vapor, or a combination thereof, generated by an explosion.

3.2.4 *fragment, n*—solid material propelled from an explosion as a result of fragmentation.

3.2.4.1 *primary fragment, n*—fragment produced from the explosive device itself.

3.2.4.2 *secondary fragment, n*—fragment produced from the container or environment where the container is placed; a piece of receptacle broken off as a result of the charge being detonated inside of it.

3.2.5 *fragmentation, n*—breaking up of the confining material of a chemical compound (or mechanical mixture) when an explosion takes place.

**D882**

3.2.6 *overpressure, n*—pressure, exceeding the ambient pressure, manifested in the shock wave of an explosion. **DoD 4145.26 M**

3.2.7 *rigid plastic, n*—for purposes of general classification, a plastic that has a modulus of elasticity, either in flexure or in tension, greater than 700 MPa [100 000 lbf/in<sup>2</sup>] at 23°C [73 °F] and 50 % relative humidity when tested in accordance with Test Method D747, Test Methods D790, Test Method D638, or Test Methods D882.

**D882**

3.2.8 *trash receptacle, n*—public or commercial use refuse bin that holds discarded items until collected.

3.2.8.1 *Discussion*—The capacity of a trash receptacle specified according to this standard is typically less than 200 L [50 gal].

#### 3.3 Definitions of Terms Specific to This Standard:

3.3.1 *blast resistance, n*—the non-numerical attribute of a trash receptacle that is established when the results of explosive testing of the submitted specimens meet all performance requirements given in Specification E2740.

3.3.2 *blast resistant trash receptacle, n*—a trash receptacle that conforms to the requirements given in Specification E2740.

3.3.3 *crowded places, n*—public areas where groups of people may concentrate for a continuous or limited period of time.

3.3.3.1 *Discussion*—Examples of public areas that may be crowded include:

- (1) buildings and related structures such as parking garages, including their access and egress points,
- (2) entertainment and event venues,
- (3) transportation terminals such as airports, train stations, and other public transportation stations,
- (4) ticket counters, concession stands, retail stores, and dining establishments, and
- (5) pedestrian walkways, sidewalks, streets, alleys, parks, plazas, playgrounds, schoolyards or other similar areas.

3.3.4 *force protection, n*—numerical level of blast resistance of a trash receptacle expressed in the mass equivalent of trinitrotoluene (TNT) explosive.

3.3.5 *public area, n*—a space or place that is open and accessible to all people, regardless of whether it is publicly or privately owned.

### 4. Summary of Guide

4.1 This guide takes into account two major factors, operational and explosive effects considerations, that need to be considered when deploying blast resistant trash receptacles.

4.2 The guide provides a list of factors to be considered in developing a threat assessment evaluating the basis of the deployment. For purposes of this standard, a major reason for conducting the threat assessment is to estimate the force protections required of the blast resistant trash receptacles being considered for deployment throughout the facility or venue.

4.3 Guidance for deployment is given in the form of directives indicating where it is recommended or not recommended for generally placing the blast resistant trash receptacles at both exterior and interior locations of the facility or venue. This guidance addresses both operational considerations and explosive effects considerations.

4.3.1 Operational considerations pertain to those factors that impact the use of blast resistant trash receptacles with regard to the collection and removal of trash from the facility or venue and factors relevant to bomb squads in the investigation and neutralization of a suspicious package.

<sup>5</sup> Available from the American Public Transportation Association, 1666 K Street, NW, Washington, DC, 20006-1215.