



Standard Practice for Evaluating Response Robot Capabilities: Logistics: Packaging for Urban Search and Rescue Task Force Equipment Caches¹

This standard is issued under the fixed designation E2592; 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 (ε) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

Anyone interested in developing or deploying response robots for hazardous environments needs ways to quantitatively measure whether a particular robot is capable of performing and reliable enough to perform specific missions. These missions decompose into sets of elemental robot tasks that can be represented individually as standard test methods and repeatedly tested to gain confidence and proficiency. They provide a tangible language to communicate mission requirements and demonstrate robot capabilities.

The ASTM International Standards Committee on Homeland Security Applications, Operational Equipment Subcommittee, Robots Task Group (E54.08.01) specifies standard test methods, practices, and guides for evaluating response robots. These standard test methods measure individual robot capabilities to facilitate comparisons among different robot models or different configurations of a particular robot model. The overall set of standards addresses the robotic logistics, terminology, safety, maneuvering, terrains, obstacles, dexterity, sensing, communications, energy/power, durability, proficiency, and autonomy.

These standards support robot researchers, manufacturers, and user organizations in different ways by enabling testing of chosen combinations that address envisioned mission tasks. Researchers use them to understand mission requirements, refine innovative approaches, and demonstrate breakthrough capabilities. Manufacturers use them to evaluate design decisions, integrate payloads and emerging technologies, and harden systems. Responder organizations use them to guide purchasing, align with deployment objectives, and focus training with measures of operator proficiency.

1. Scope

1.1 This practice covers the requirement that urban search and rescue robots and all necessary associated components or equipment (for example, operator control station, power sources, spare parts, sensors, manipulators, tools, and so forth) shall complement the response organization's cache packaging and transportation systems.

1.2 Shipment by ground, air, or marine should be considered.

1.3 Volume, weight, shipping classification, and deployability of the robots and associated components are considered in this practice.

1.3.1 The deployability is considered through the determination of:

1.3.1.1 The length of time required to prepare the robot system for deployment, and

1.3.1.2 The types of tools required for servicing the robot system in the field.

1.3.2 Associated components or equipment include not only all the onboard sensors, tethers, and operator control station, but also any spare parts and specialized tools needed for assembly, disassembly, and field servicing.

1.3.3 Associated components also include power equipment necessary for the operation of the system, such as batteries, chargers, and power converters. Gasoline, diesel, or other types of liquid fuel are not included.

¹ This practice is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.08 on Operational Equipment.

Current edition approved Jan. 1, 2016. Published January 2016. Originally approved in 2007. Last previous edition approved in 2007 as E2592 – 07. DOI: 10.1520/E2592-16.