



Designation: E2463 – 19

Standard Performance Specification for Cargo Bed Cover (CBC) M105A2 Trailer, Type II¹

This standard is issued under the fixed designation E2463; 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.

1. Scope

1.1 This specification covers the general performance requirements for the Type II Cargo Bed Cover (CBC). The Type II Cargo Bed Cover is a removable general purpose rigid wall enclosure that is mounted on the M105A2 Trailer, Cargo: 1.5 Ton, 2 Wheel. The Type II CBC provides environmental protection and security for mission equipment and items of general transport.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parenthesis are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 The following safety hazards caveat pertains only to the test required portion, Section 5, of this specification: *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 requirements prior to use.*

1.4 *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:²

- E631 Terminology of Building Constructions
- E1749 Terminology Relating to Rigid Wall Relocatable Shelters
- E1925 Specification for Engineering and Design Criteria for Rigid Wall Relocatable Structures

2.2 Army Standards:³

- ARMY TM 9-2320-280-10 HMMVW Training Manual
- ARMY TM 10-5411-232-13&P Cargo Bed Cover Technical Manual

2.3 Commercial Standards:

- ANSI/ASQC Z1.4-2003 Sampling Procedures and Tables for Inspection by Attributes⁴
- SAE AS8090 Mobility, Towed Aerospace Ground Equipment, General Requirements for⁵

2.4 Federal Standard:⁶

- FED-STD-595 Colors Used in Government Procurement

2.5 Military Standards:⁶

- MIL-C-46168 Coating, Aliphatic Polyurethane, Chemical Agent Resistant
 - MIL-C-53039 Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant
 - MIL-DTL-53072 Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection
 - MIL-PRF-22750 Coating, Epoxy, High Solids
 - MIL-STD-129 Military Marking for Shipment and Storage
 - MIL-STD-209 Interface Standard for Lifting and Tiedown Provisions
 - MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests
 - MIL-STD-913 Requirements for the Certification of Sling Loaded Military Equipment for External Transportation by Department of Defense Helicopters
 - MIL-STD-1366 Transportability Criteria
- #### 2.6 Military Handbook:⁶
- MIL-HDBK-1791 Designing for Internal Aerial Delivery in Fixed Winged Aircraft
- #### 2.7 ACGIH Document:⁷
- ACGIH Threshold Limit Values

¹ This specification is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.53 on Materials and Processes for Durable Rigidwall Relocatable Structures.

Current edition approved July 1, 2019. Published August 2019. Originally approved in 2005. Last previous edition approved in 2011 as E2463–11. DOI: 10.1520/E2463–19.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from U.S. Army Natick Soldier Systems Center, ATTN: AMSRD-NSC-CP-CS, General Greene Avenue, Natick, MA 01760, <http://www.army.mil/> natick.

⁴ Available from American Society for Quality (ASQ), 600 N. Plankinton Ave., Milwaukee, WI 53203, <http://www.asq.org>.

⁵ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, <http://www.sae.org>.

⁶ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁷ Available from American Conference of Governmental Industrial Hygienists (ACGIH), 1330 Kemper Meadow Dr., Cincinnati, OH 45240, <http://www.acgih.org>.

2.8 Drawings:³

- 81337-104008 Cargo Bed Cover, Type II (MI05A2 Trailer)
- 81337-104269 Cargo Bed Cover, Type II (MI05A2 Trailer), Three-Color Camouflage

3. Terminology

3.1 *Definitions*—For definitions of general terms related to building construction used in this specification, refer to Terminology E631, and for general terms related to rigid wall relocatable shelters, refer to Terminology E1749.

4. General Requirements

4.1 *Alternate Components and Construction*—The interface herein drawings referenced specify the use of specified components and construction of previously produce CBCs. Specific materials, components, and construction methods shall be considered for reference only. Dimensional characteristics specified in the interface drawings that are required for spare part interchangeability and for operation and interoperability of the CBC with the vehicle shall be adhered to. When this specification or the referenced drawings specify use of specific components, the contractor may substitute a component equal to the specified component provided that the contractor complies with the performance requirements specified herein.

4.2 *Design and Construction Requirements*—Design and construction of the Type II CBC shall conform to the requirements specified on the drawings, all subsidiary drawings, and parts lists.

4.2.1 *Dimensions, Weight, and Payload*—The Type II CBC shall conform to the dimensions of drawing 81337-104008. The Type II CBC including its mounting hardware, shall weigh no more than 350 lb. The Type II CBC shall be capable of carrying 500 lb of payload mounted to its interior payload provisions (see 4.4.2).

4.2.2 *Tailgate Operation*—The Type II CBC, when mounted on its carrier, shall not inhibit operation of the carrier's tailgate.

4.2.3 *Blackout*—The Type II CBC/carrier combination, with the personnel door and ports closed, shall not permit a light source from within to emit detectable amounts of light.

4.2.4 *Parts Interchangeability*—The spare parts of the CBC produced under this specification shall be functionally and dimensionally interchangeable with the parts specified below without modification or rework of the part or assembly.

NSN	Part Number	Description
1005-01-044-4555	700272	Handle, Chest
5410-00-984-5065	104055	Step, Folding
5411-01-481-5892	104050	Ventilator, 2 Way
5340-00-302-1840	104054	Holder, Door
5340-01-481-6506	104053	Lock, Door, 3 Point
5340-01-481-6503	104052	Lock, Door, 2 Point
2510-01-481-6073	104014	Door, Lower
2510-01-481-6047	104013	Door, Upper
5440-01-481-6010	104049	Ladder, 24 Inch

4.2.5 *Mounting*—The Type II CBC shall be capable of multiple mounting and dismounting cycles from its carrier, in accordance with its technical manual, without damage or degradation to either the Type II CBC, its carrier or its mounting provisions and hardware. Any hardware required for mounting the CBC to the trailer shall be provided as part of the Type II CBC. Mounting and dismounting shall be accom-

plished using only those tools of the Basic Issue Items (BII) and the Additional Authorization List (AAL) as described in the High-Mobility Multipurpose Wheeled Vehicle's (HM-MWV) Operator's Manual, ARMY TM 9-2320-280-10.

4.2.6 *Toxicity*—Materials used shall cause no skin irritations or other injuries and produce no vapor hazards, including the emission of toxic or noxious odors, to personnel, in or around the Type II CBC, under all environmental conditions. Exposure of personnel to toxic substances shall not be in excess of the threshold values contained in the ACGIH Threshold Limit Values.

4.2.7 *Workmanship*—The Type II CBC, including all parts and accessories shall be constructed and finished in a workmanlike manner with particular attention given to removal of burrs and sharp edges, accuracy of dimensions, welding, painting, alignment of parts and assemblies, and the tightness of screws, bolts, and so forth. Cloth components shall be clean and free of holes, cuts, or tears. All components shall be properly adjusted before the Type II CBC is prepared for delivery to the purchaser.

4.3 *Materials and Components*—Materials and components shall meet the following performance requirements.

4.3.1 *Personnel Door*—The Type II CBC shall be equipped with a personnel door as specified on the drawings. A door stop, for securing the personnel door in its fully opened position, shall be provided. In its closed position the personnel door shall prevent the intrusion of driven rain and dust and shall provide blackout protection.

4.3.1.1 *Door Handle*—The personnel door shall be equipped with a door handle that provides positive closure. From either side, the door handle shall be capable of being moved to its opened or closed position with a maximum force of 10 lb applied to the door handle. The personnel door shall be capable of being padlocked from the outside securing the Type II CBC from the exterior.

4.3.1.2 *Secondary Exit*—A secondary exit shall be provided within the personnel door. The secondary exit shall be as specified on drawings. The secondary exit shall be capable of being opened with a maximum force of 10 lb applied to the release mechanism from inside of the Type II CBC with: (1) the tailgate closed and the personnel door locked, (2) the tailgate closed and the personnel door unlocked, and (3) the tailgate open and the personnel door locked. With the personnel door locked, the secondary exit shall not be capable of being opened from outside the Type II CBC. The secondary exit shall provide unobstructed egress for military personnel.

4.3.2 *Ladder*—A ladder shall be provided as specified on the drawings. The ladder shall be capable of supporting at least 400 lb applied to any individual step without damage or degradation to the Type II CBC, carrier or ladder. The Type II CBC shall have a stowage location for the ladder capable of securely retaining the ladder in all transportation modes without impeding any operations of the Type II CBC or its carrier.

4.3.3 *Roof Access Steps/Handholds*—Roof access steps/handholds shall be provided for safe access from the ground to and from the roof when the Type II CBC is mounted on its carrier. Each roof access step/handhold shall be capable of

supporting 400 lb without damage or degradation to either the Type II CBC or the roof access step/handhold.

4.3.4 *Power and Signal Access Ports*—Two ports shall be provided in the front wall to permit the pass through of power and signal lines to the Type II CBC enclosed area. The power and signal access ports shall have provisions to prevent the intrusion of driven rain and dust and have provisions for blackout.

4.3.5 *Vents*—The Type II CBC shall include two vents for fresh air ventilation as specified on the drawings. The vents shall prevent intrusion of driven rain and have provisions for blackout. Vents shall be capable of providing ventilation when the vehicle is both stationary and on the move. The interior surface of the door shall have a warning in at least 1½ in. high letters contrasting the color of the door. The warning shall say “Warning: Suffocation hazard door must remain open while occupied.”

4.4 *Structural Requirements:*

4.4.1 *Roof Loads*—The Type II CBC roof shall be capable of supporting, without structural damage, degradation or permanent deformation: (1) a uniformly distributed load of 40 lb/ft² over the entire surface, and (2) a concentrated load of 660 lb over a 1 by 2 ft area applied anywhere on the roof.

4.4.2 *Interior Payload Provisions*—The Type II CBC shall be capable of accepting threaded fasteners such as rivets and inserts for mounting equipment to the interior of the Type II CBC in accordance with Technical Manual ARMY TM 10-5411-232-13&P. The Type II CBC and its Interior Payload Provisions shall be capable of supporting at least 500 lb of payload during its stationary, rail transport, ground mobility, and crane lifting operation modes without damage or degradation to either the Type II CBC or its interior payload provisions. The payload shall be attached to the interior surfaces using interior payload provisions and shall be distributed as follows: 100 lb mounted to each of the three wall surfaces, excluding the door surface, and 200 lb mounted to the ceiling.

4.4.3 *Personnel Door Loads:*

4.4.3.1 *Personnel Door Structure*—The personnel door, including its frame(s) and hardware, shall be capable of supporting a 200 lb static load without damage or degradation to either the Type II CBC, or its personnel door, frame(s) and hardware. The load shall be applied parallel to the hinge line, along the door edge opposite the hinge, with the personnel door open to 90 degrees. The personnel door shall operate freely after application of the load.

4.4.3.2 *Door Stop*—The personnel door, including its frame(s) and hardware, shall withstand a wind gust of 60 mph in any direction when the door is secured by its door stop.

4.4.4 *Surface Impact Resistance*—The exterior surface of the Type II CBC’s roof shall be capable of withstanding a blow from a 30 lb steel cylinder, 3 in. in diameter with a hemispherical end, dropped from a height of 30 in., without structural degradation. All other exterior wall surfaces shall be capable of withstanding a blow from the same steel cylinder, dropped from a height of 16 in., without structural degradation.

4.5 *Transportability*—The Type II CBC/carrier combination shall be capable of meeting the requirements for transport in the following modes:

4.5.1 *Rail*—The Type II CBC/carrier combination with payload shall: (1) meet the Gabarit International de Chargement (GIC) equipment gauge envelope as defined in interface standard MIL-STD-1366, and (2) be capable of withstanding multiple rail impacts without damage or degradation to either the Type II CBC or its carrier and without damage to the tie-down cables, or blocking or bracing.

4.5.2 *Fixed Wing*—The Type II CBC/carrier combination shall be transportable in C-130 and larger Air Mobility Command (AMC) aircraft. The combination shall also be capable of roll-on/roll-off loading at ramp angles of 15 degrees on the C-130 and larger AMC aircraft without special handling procedures or equipment.

4.5.3 *Helicopter Sling Load (HSL)*—The Type II CBC mounted on its carrier, in all its payload configurations, shall be capable of being externally transported by CH-47 or larger rotary wing aircraft in the single point, dual point and tandem configurations without damage or degradation to either the Type II CBC or the Trailer. The Type II CBC/carrier combination shall be structurally capable of meeting the requirements of interface standard MIL-STD-209 and MIL-STD-913 and shall show no signs of damage or degradation as a result of being flown.

4.5.4 *Ground Mobility*—The Type II CBC/carrier combination, shall be capable of meeting the requirements of SAE AS8090 for Type V mobility without damage or degradation to either the Type II CBC or its carrier. The Type II CBC/carrier combination shall meet U.S. and NATO countries’ highway legal limits.

4.5.5 *Lifting Provisions*—The Type II CBC shall be equipped with lift provisions to enable it, with its payload, to be lifted on and off its carrier without damage or degradation to either the Type II CBC or its lift provisions. The Type II CBC’s lift provisions shall conform to the crane lift requirements of interface standard MIL-STD-209.

4.6 *Finish and Marking:*

4.6.1 *Non-Skid Surfaces*—All horizontal surfaces of the Type II CBC (that is, interior floor and exterior roof) shall be non-skid.

4.6.2 *Interior Color*—The color of the interior walls and ceiling of the Type II CBC shall be semi-gloss white, Color Chip Number 27875, of FED-STD-595.

4.6.3 *Exterior Color*—The exterior color of the Type II CBC shall either three-color camouflage pattern in accordance with drawing 81337-104269 or sand, Color Chip Number 686, of FED-STD-595 as specified in the purchase order (see 7.2). The interior surface of the personnel door and secondary exit shall match the primary exterior color of the Type II CBC.

4.6.4 *Chemical Agent Resistance*—All exterior surfaces, except weather seals and gaskets, shall be Chemical Agent Resistant Coated (CARC) in accordance with MIL-DTL-53072 using either MIL-C-46168 or MIL-C-53039 chemical agent resistant coatings. All interior surfaces, except weather seals and gaskets, shall be Chemical Agent Resistant Coated (CARC) in accordance with MIL-DTL-53072 using MIL-PRF-22750 chemical agent resistant coating. Weather seals shall be

resistant to chemical and biological agent contamination, decontamination fluids and petroleum products or be replaceable at the unit level.

4.6.5 *Identification*—The Type II CBC shall be marked in accordance with MIL-STD-129.

4.7 *Environmental Requirements*—Unless otherwise specified, the Type II CBC shall meet the following environmental requirements in both the height extended and height retracted configurations.

4.7.1 *Humidity Resistance*—The Type II CBC shall be capable of withstanding daily exposure of up to 97 % relative humidity for 20 h and exposure of 100 % relative humidity (with condensation) for 4 h without evidence of corrosion, structural damage, degradation, or permanent deformation.

4.7.2 *Marine Atmosphere*—The Type II CBC, when exposed to a marine environment equivalent to 25 lb per acre per year (2.0 g/m²/yr), shall not corrode or degrade.

4.7.3 *Ice*—The Type II CBC including its door(s), vents, and cable ports shall be capable of withstanding and remaining operational while the Type II CBC is exposed to the forces and effects due to the accumulation of 0.25 in. (6 mm) of ice produced by freezing rain, mist, or sea spray.

4.7.4 *Temperature Range*—The Type II CBC shall be capable of withstanding temperatures ranges of –60 to 160 °F in storage and transit and –60 to 120 °F plus solar load for normal operations. The Type II CBC, including fasteners, seals or other hardware, shall show no evidence of corrosion or degradation.

4.7.5 *Temperature Shock*—The Type II CBC shall withstand a temperature shock from an equilibrium state of 160 to –70 °F within 5 min and from an equilibrium state of –70 to 160 °F within 5 min without evidence of structural damage, degradation or permanent deformation.

4.7.6 *Blowing Sand and Dust*—The Type II CBC, when mounted on its carrier, shall resist the effects of blowing sand and dust without damage or degradation. The Type II CBC shall remain fully operational with no more than 16.80 in.³ (0.50 pint) of sand penetration into the interior of the Type II CBC. Blowing sand is defined as 150 – 1000 micron particles in concentrations of 1.32 × 10^{–4} lb/ft³ with a wind speed of 1750 ft/min.

4.7.7 *Ultraviolet Effects*—The Type II CBC shall show no evidence of structural damage, degradation or permanent deformation as a result of exposure to ultraviolet effects.

4.7.8 *Flame Resistance*—The Type II CBC shall be non-burning or self-extinguishing (that is, have a flame time of less than 30 s) after removal of a flame.

4.7.9 *Fungus*—The Type II CBC shall be impervious to fungus growth. Materials shall be selected to minimize fungus growth.

4.7.10 *Watertightness*—The Type II CBC, when mounted on its carrier, without the aide of supplementary sealing, caulking, taping or other means, shall be capable of withstanding a 40 psig spray from nozzles located 19 in. from, and normal to, each external Type II CBC surface. The Type II CBC shall not allow more than 8 fluid oz. of water into the interior of the Type II CBC in a 40 min period and the weight of the Type II CBC shall not increase by more than 1.00 lb.

4.8 *Other Requirements:*

4.8.1 *First Article*—When specified (see 7.2), a sample shall be subjected to first article inspection (see 5.2.1). A first article is defined as a preproduction or an initial production sample consisting of one or more completed Type II CBC.

4.8.2 *Inspection Comparison Testing Sample*—When specified (see 7.2), the contractor shall furnish a sample for comparison inspection and approval (see 5.2.2).

4.8.3 *Manuals*—Unless otherwise specified (see 7.5), technical manuals shall be provided with each Type II CBC.

5. Quality Assurance

5.1 *Responsibility for Inspection*—Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein unless disapproved by the purchaser. The purchaser reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

5.1.1 *Responsibility for Compliance*—All items must meet all requirements of Sections 4 – 6. The inspections set forth in this specification shall become a part of the contractor’s overall inspection system or quality program. The absence of any inspection requirement in the document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the purchaser for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the purchaser to acceptance of defective material.

5.1.2 *Responsibility for Dimensional Requirements*—Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, the inspection shall be made at any point or at all points in the manufacturing process necessary to ensure compliance with all dimensional requirements.

5.2 *Classification of Inspections*—The inspection requirements specified herein are classified as follows:

5.2.1 *First Article Inspection*—When a first article inspection is required (see 4.8.1 and 7.2); the Type II CBC shall be examined for the visual defects in Table 1, dimensions specified, and tested as specified and in the sequence specified in Table 2. Unless otherwise specified (see 7.2), all testing shall be performed on the same Type II CBC. The presence of any visual defect, any dimension not within the specified tolerance, or failure of any test shall be cause for rejection of the first article.

5.2.2 *Comparison Sample Inspection*—When a comparison sample inspection is required (see 7.2), it shall be inspected and tested as specified in 5.2.1.

5.2.3 *Quality Conformance Inspection*—Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4-2003.