

GL-PD-09-04H

Purchase Description (PD)

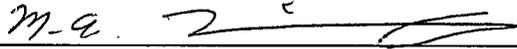
for the

Enhanced Combat Helmet

3 May 2012

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Approved by:



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4 May 2010
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Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: Marine Corps Systems Command, CESS, Attn: PM Infantry Combat Equipment, 2200 Lester Street, Quantico, VA 22134-6050 or via e-mail to peter.manternach@usmc.mil.

Record of Change

Ver	Date	Paragraph	Comment	Approval
	14 Apr 09	N/A	Initial Release	See signature page
A	26 Jan 10		Update from DT I testing	\\Original Initialed\\ 03/09/2010
B	3 Mar 10	3.5.1, 3.5.6, 3.14.1, 4.4, Table X	Change to size and shape verification and clarifications	\\Original Initialed\\ 03/09/2010
C	24 Jun 10	3.12.4, 4.19.4, 3.5.5, 3.12.13, Table X, 4.10.3, 4.18, 4.19.4, 6.5.3	Align flame resistance requirement with current fire resistant clothing; clarifications to other PD requirements	\\Original Initialed\\ 06/24/2010
D	21 Dec 10	various	Update from DT II testing	\\Original Initialed\\ 12/21/2010
E	25 Jan 11	3.5.6, 3.5.6.3, 3.6.1 3.7, 3.7.1.1, 3.13.1, 3.13.2, 3.13.3, 3.13.5.1, 4.8, 4.12, 4.18.1, 4.21.5, 4.21.6, 4.21.7, 4.12.8, 4.22.1	Combined Color requirements; Clarified pad configuration; Labeling modification; clarification of label permanence; clarification of V ₅₀ method; Clarification of washability	\\Original Initialed\\ 01/28/2011
F	13 Apr 11	3.5.6, 3.5.6.3, 3.5.6.4.1, Table II, Table III, Table IV, 3.7, 3.13, 3.13.1, 3.13.3, 3.13.4, 3.13.5.2 , Add 4.1.8, Table IX, Table X, 4.4, 4.15, 4.20, 6.2, 6.9	Changed color of shell to Coyote 498; clarified location and size of markings on helmet shell; added requirement for unique designator; deleted packaging requirement for retention systems when purchased as a individual component; deleted requirement for UPC; clarified colorfastness requirements do not apply to leather; Added rounding requirement for measurements; updated shade matching test procedures; correct circular reference between 5.1 and 6.2f; corrected part number for ECH X-back.	\\Original Initialed\\ 4/18/2011

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G	30 Oct 11	3.7, 3.12.1, 3.12.2, 3.12.5, 3.12.6, 3.12.7, 3.12.8, 4.13.4, 4.18.2.1, 4.18.3, 4.20, 4.21.1, 4.21.2, 4.21.5, 4.21.6, 4.21.7, 4.21.8, 4.21.14, Figure 1	Clarification of Hook/Loop Adhesion pass/fail criteria; Addition of IOP PED-003 Exception Memo; Work Package reference change; Clarification of USON for environmental conditioning, clarification of standard pad configuration, clarification of blunt impact test	\\Original Initialed\\ 11/4/2011
H	04 May 12	3.13.1, 4.3, Table IX	Clarification of Label Font Size pass/fail criteria; Updated Table IX to reflect visual inspection of Retention system for LAT.	<i>nan</i>

Table VII are desired. Testing shall be conducted in accordance with Paragraph 4.19.

Table VII: Weight

Size	Maximum Weight (pounds)
Extra-Small (XS)	2.82
Small (S)	2.94
Medium (M)	3.06
Large (L)	3.31
Extra-Large (XL)	3.88
Extra Extra-Large (XXL)	4.00

3.11 Bump or Blunt Impact Protection

The finished helmet shall provide non-ballistic impact protection to the wearer by reducing acceleration of the head during low velocity blunt impact events at various temperatures. As a threshold, for each size helmet with 3/4-inch thick pads (mandatory source), and for all tests including the various impact sites and temperatures specified as well as both first and second impacts, no individual acceleration shall exceed 150 G (gravitational constant). Greater impact protection (i.e., fewer G) is desired as an objective. There shall be no physical damage to the helmet shell such as shell fracture, defined as a separation/split of the ballistic material through the entire thickness of the helmet shell, or indentation depth in excess of 0.15 inches present after impact testing (delamination and ply separation are permitted). Additionally there should be no damage to any part of the retention system or pad system. Testing shall be in accordance with Paragraph 4.20.

3.12 Operating Environment

All helmet components shall be constructed such that they can withstand various environmental extremes without degradation.

3.12.1 Seawater Resistance

There shall be no structural, visible, or operational degradation to the finished shell when subjected to immersion in seawater. The finished shell shall show no evidence of softening, peeling, blistering, cracking, delamination, or increase in weight of greater than 3.0% over dry weight or when tested in accordance with Paragraph 4.21.1 and 4.19. If the helmet shell exhibits these visual defects, helmets shall be ballistically tested to determine if the helmet has been operationally degraded. The finished shell thickness will be measured before and after conditioning as Government Reference

shall be declared inconclusive and another helmet shall be tested.

4.18.2 Ballistic Test Method for Resistance to Penetration (RTP)

4.18.2.1 Resistance to Penetration - 9 mm

Testing shall be done in accordance with IOP PED-003. Shell RTP testing shall be tested with the clay filled headform described in IOP PED-003 and IOP PED-003 Exceptions Memorandum. The hardware shall be tested using the witness plate headform described in IOP PED-003 and IOP PED-003 Exceptions Memorandum. Failure to meet the requirements in Paragraph 3.9.2 shall constitute a test failure.

4.18.2.2 Resistance to Penetration - Small Arms

Small Arms RTP is defined in Classified Annex A.

4.18.3 Ballistic Transient Deformation (BTD)

BTD testing shall be conducted in accordance with IOP PED-003 and IOP PED-003 Exceptions Memorandum. Shell BTD testing shall be tested with the clay filled headform described in IOP PED-003 and IOP PED-003 Exceptions Memorandum. Failure to meet the deformation requirements in Paragraph 3.9.3 shall constitute a test failure.

4.19 Weight Examination

The finished helmet shall be weighed on a scale accurate to 0.01 pounds for conformance to the weight requirements in Paragraphs 3.10 and 3.12.1. Finished helmets shall be preconditioned at ambient for a minimum of 24 hours. Any non-conformance with the weight requirements in Paragraphs 3.10 and 3.12.1 shall constitute a test failure.

4.20 Blunt Impact Protection

The blunt impact protection of the complete finished helmet shall be determined in accordance with DOT FMVSS 218 Section 3.7.1 with the following exceptions:

a. Each helmet shall be tested with the pad suspension system arranged inside the helmet as shown in the "standard pad configuration" arrangement in Technical Manual (TM) 10-8470-204-10, Work Package 0007 (7-pad configuration with the oblong/oval pads in the vertical pad configuration).

b. The environmental conditions shall be ambient, cold 14°F (+5°F), and hot 130°F (+5°F). Helmets shall be conditioned for a minimum of 12 hours prior to test.

c. The hot and cold environmental impacts shall be conducted within five minutes after the helmets are removed from the environmental conditioning chamber. Helmets shall be returned to the conditioning chamber and exposed for at least 15 minutes before removal for another test.

d. Water immersion testing is not required.

e. The impact anvil used for all tests shall be the hemispherical anvil.

f. Helmets shall be fitted to the appropriate size DOT (FMVSS 218) headform (size x-small and small ECH use small DOT headform; medium and large ECH use medium DOT headform, x-large and xx-large ECH use large DOT headform.)

g. Each helmet shall be impacted two times at seven locations. These include the front, back, left side, right side, lower left rear, lower right rear, and the crown. The headform shall be oriented as described in Table XVIII for each particular impact site. Additionally, Figure 6 of Annex B shows the orientation of all locations except the left and right nape.

h. Two successive impacts shall be made at each location. The second impact shall be made no sooner than one minute after the first and no later than two minutes after the first.

i. The velocity for each impact shall be 10 (+0.3) feet per second.

j. Ensure that no plastic components (ladder-locks) are caught between the helmet shell and the headform prior to testing.

h. Helmets shall be mounted in the as worn position with the following HPI: Small - 2.0 inches, Medium - 2.5 inches, Large - 2.3 inches, X-Large 2.8 inches. The front retention strap adjustment buckle will be located half way down the front straps. The nape strap adjustment buckles will be sufficiently tight and even (left and right) to prevent sagging (separation of the helmet from the headform) or movement prior to impact. The adjustable chin strap hook and loop fastener will not overlap each other and the chin cup will be centered on the foam chin and headform.

Failure of any helmet to meet the requirements of Paragraph 3.11 shall constitute a test failure.