REPORT NO. 94-20

STINGER MISSILE
EXTERNAL AERIAL
TRANSPORT (EAT)
CERTIFICATION

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Prepared for:
U.S. Army Armament Research, Development
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SUBJECT: STINGER Missile External Aerial Transport (EAT) Certification

1. Enclosed is the U.S. Army Defense Ammunition Center and School (USADACS) Report No. 94-20.

2. The POC is Mr. Quinn D. Hartman, SMCAC-DEV, DSN 585-8992, commercial (815) 273-8992.

FOR THE DIRECTOR:

Encl

as

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Director
The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC) to conduct a static pull test on the STINGER missile pallet as part of the helicopter External Aerial Transport (EAT) certification process. As prescribed by MIL-STD-209, Military Standard Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment, the pallet was loaded to 4,200 pounds for a period of 90 seconds utilizing a four-legged sling. The first article pallet initially tested was noted to have minor permanent deformation in the toplift frame upon completion of the test. Since no permanent deformation is allowed, the first article pallet was determined to have failed the MIL-STD-209 static pull test. A second pallet toplift frame was constructed substituting 10 gauge metal for 12 gauge metal. The lift test was repeated with the new toplift frame on the pallet. Upon completion of the test, the pallet was inspected and determined to have sustained no permanent deformation as a (continued)
result of the static load. Having successfully passed MIL-STD-209 requirements, the STINGER missile pallet was transported to U.S. Army Combat Systems Test Activity (USACSTA) for helicopter flight testing.
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PART 1

INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC) to conduct a static pull test on the STINGER missile pallet as part of the helicopter External Aerial Transport (EAT) certification process. Testing was conducted IAW MIL-STD-209, Military Standard Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment.

B. AUTHORITY. The test was accomplished IAW mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, Illinois. Reference is made to the following:


2. AMCCOM-R 10-17, Mission and Major Functions of USADACS, 13 January 1986.

C. OBJECTIVE. The purpose of this test was to determine if the toplift frame and strapping configuration of the pallet was sufficient to withstand the rigors associated with EAT prior to flight testing.

D. CONCLUSION. Following successful completion of MIL-STD-209 requirements, the modified STINGER missile pallet was determined to be suitable for helicopter flight testing. The STINGER missile pallet was forwarded to U.S. Army Combat Systems Test Activity (USACSTA) for helicopter flight testing.
PART 2

23 MAY AND 17 JUNE 1994

ATTENDEES

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PART 3

TEST PROCEDURES

As part of the External Aerial Transport (EAT) certification procedure, a static load of 4,200 pounds was applied to the STINGER missile pallet IAW MIL-STD-209. Prior to testing, the 1,200-pound pallet was secured to an M872 semitrailer utilizing two 1-1/4-inch metal bands over the top of the second layer of missile containers (see part 5). A 50,000-pound-capacity container handler was connected to the pallet utilizing a four-legged sling appropriate for helicopter slinging. The pallet was then pulled to the design limit load (3.5 times the pallet weight) for a period of 90 seconds. During the pull, the static load was monitored with a 5,000-pound-capacity dynamometer. Upon completion of the test, the pallet was inspected for damage due to the static load.
PART 4

TEST RESULTS

Upon completion of MIL-STD-209 testing, the STINGER missile pallet was inspected for damage from the static loading. The first article pallet that was initially tested was noted to have minor permanent deformation in the toplift frame. Since no permanent deformation is allowed, the first article pallet was determined to have failed the MIL-STD-209 static pull test. A second pallet toplift frame was then constructed substituting 10 gauge metal for 12 gauge metal. The lift test was repeated with the new toplift frame on the pallet. Upon completion of this test, the pallet was inspected and determined to have sustained no permanent deformation as a result of the static load. Metal strapping used to unitize the pallet was also determined to have sustained no damage as a result of the static loading.
PART 5

PHOTOGRAPH
Photo No. AO317-SCN94-160-2378: This photo shows the STINGER missile pallet attached to the M872 semitrailer during MIL-STD-209 static pull testing.
PART 6

DRAWINGS
NOTES:
2. PROTECTIVE FINISH SHALL BE IN ACCORDANCE WITH DNS AC200000433.
   COLOR SHALL BE GREEN NO 303 PER MIL-E-46196B
   (FED STD 595 NO 303G)
3. MARKING PAINT SHALL BE IN ACCORDANCE WITH DNS AC200000433.
   COLOR SHALL BE WHITE NO 31075 0.50 INCH HIGH LETTERS.
4. WELDMENT CONSTRUCTION SPEC MIL-ST-1261 APPLIES.
5. DIMENSIONS OF THE RETAINER RING MAY BE VARIED TO ENSURE THE RING'S
   POSITION WHEN LIFTED VERTICALLY SHALL BE BETWEEN 7.5 AND 8.5 DEGREES
   WITH THE HORIZONTAL.  THIS DIMENSION ASSUMES THAT THE RING SHALL BE
   SELF-RESTING WHEN NOT IN USE.
6. CHAMFERED CORNER SHALL NOT BE WELDED IN ORDER TO ALLOW ADDITIONAL
   DRAIN HOLE.
7. ALTERNATE ALIGNING LUG PART NO AC200000453-1 MAY BE USED
   INSTEAD OF PART NO AC200000453-3.  IF ALTERNATE LUG IS USED,
   USE 0.50 Z 2 PLACES

SECTION A-A
SOME HIDDEN LINES OMITTED FOR CLARITY

REVISION
PRODUCT DESCRIPTION
DATE
APPROVAL
ERR 03/02000 03/04/20 93-04-20

PART NO ACV00194

APPLICATION
NOTES:
2. PROTECTIVE FINISH SHALL BE IN ACCORDANCE WITH DNS AC20000432. COLOR SHALL BE GREEN NO. 303 PER MIL-C-40316.
3. MARKING PAINT SHALL BE IN ACCORDANCE WITH DNS AC20000423. COLOR SHALL BE WHITE NO. 38975 0.50 INCH HIGH LETTERS.
4. WELDMENT CONSTRUCTION SPEC MIL-STD-1261 APPLIES.
5. CHAMFERED CORNER SHALL NOT BE WELDED IN ORDER TO ALLOW ADDITIONAL DRAM HOLE.
6. ALTERNATE ALIGNING LUG PART NO AC20000453-2 MAY BE USED INSTEAD OF PART NO AC20000453-2. IF ALTERNATE LUG IS USED USE Ø0.31 4 PLACES.

SECTION A-A
SOME HIDDEN LINES OMITTED FOR CLARITY

SECTION B-B
SCALE 1/2

DRAWING NO CORE DATE (YEAR) PER NOTE 3
PER NOTE 3 1 PLACES
46.44
NOTES:
1. MIL-A-2550, ANSI/AMS A2.4-86, ANSI Y14.5M-1982 AND MIL-F-711711
   APPLY.
2. PROTECTIVE FINISH SHALL BE IN ACCORDANCE WITH DWG ACV0000423.
   COLOR SHALL BE GREEN NO 383 PER MIL-C-46169 (FED STD 595 NO 34096).
3. MARKING PAINT SHALL BE IN ACCORDANCE WITH DWG ACV0000423.
   COLOR SHALL BE WHITE NO 29750 0.50 INCH HIGH LETTERS.
4. WELDMENT CONSTRUCTION SPEC MIL-STD-1281 APPLY.
5. MAXIMUM GAP ALONG WELD LINE BETWEEN POST AND DECK OR POST AND SCD
   WILL NOT EXCEED 0.02 INCHES PRIOR TO WELDING. THIS MAY BE CHECKED
   UPON RESTRICTION BY UP TO 1500 LBS UNIFORMLY APPLIED TO THE TOP
   SURFACE OF THE DECK.
6. THIS DIMENSION IS TO BE CHECKED AT THE INSPECTION POINTS (IP) DEFINED
   IN THE TOP VIEW. THE MEASUREMENTS WILL ORIGINATE FROM DATUM A AND B.
7. WELDING WILL START 1.75 INCHES FROM END (IP) REF NO ACV00199.

SECTION B-B
SCALE 1/2

SECTION A-A
SCALE 1/4
SWAGE HOLES OMITTED FOR CLARITY
NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
2. SPEC ANSI Y14.5M-1992 APPLIES.
3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL,
   CARBON, COLD ROLL OR HOT ROLL,
   PER ASTM A568, (ASTM A360 OR A560).

SECTION A-A
64 HOLES

FULL SCALE

PART NO ACV00197
NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
2. SPEC ANSI Y14.5-1982M APPLIES.
3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL,
   CARBON, COLD ROLL OR HOT ROLL.

PART NO ACV00199

STIFFENER - PALLET, SHEET METAL

DESIGN ACTIVITY

03-04-20

U.S. Army

B. W. SHULTZ

ACV00199

APPLICATION

28520

D