15 July 1969

Materiel Test Procedure 10-2-197
General Equipment Test Activity

U. S. ARMY TEST AND EVALUATION COMMAND
COMMODITY ENGINEERING TEST PROCEDURE

PRISONER OF WAR IDENTIFICATION KIT

1. OBJECTIVE

This document provides test methods and techniques necessary to determine the technical performance and safety characteristics of POW Identification Kits as described in Qualitative Materiel Requirements (QMR's) and/or Small Development Requirements (SDR's), and Technical Characteristics (TC's) and to determine the suitability of these items for service tests.

2. BACKGROUND

A requirement exists for a simple and reliable means for the individual identification of prisoners of war. Such an identification capability is necessary to facilitate and to assure that the initial identification of individual prisoners of war, as established at the beginning of their processing, is maintained to the completion of all adminstrative processing action. Normal camp adminstration poses constant requirements for the individual identification of prisoners of war, i.e., work details, disciplinary actions, security checks, sick call, intercamp transfers, etc. Camp security operations would be facilitated by the focusing of attention to those prisoners of war who, while professing to be anti-Communisits or assuming a neutral role, attempt to conceal or falsify their true identities by removal and/or exchange of identification bands. The proposed identification band would supplement but not replace the fingerprint system of identification which would continue to be used under circumstances involving positive and unquestioned identification. The primary requirement is that once attached to an individual it may not be removed and exchanged between individuals without sufficient disfigurement to permit ready detection by casual inspection.

A number of secondary uses may be anticipated; for example, the identification of U. S. Army military prisoners, casualties, stragglers, civilian internees, and, under certain counterinsurgency operations, the entire civilian population of villages, cities, or territories.

The identification kit will be a self-contained, portable package consisting of wrist bands, a suitable mechanism for printing or writing identification directly on the band or onto a name slip which would be inserted in the band, a means for joining the two ends of the band, and a supply of color-coded name slips.

3. REQUIRED EQUIPMENT

a. Scale
b. Steel Measuring Tape.
c. Still Camera and Film.
d. Color Difference Meter.
e. Light Meter.

f. Tensile Tester.

g. Laboratory Facilities for Standard Allergenic and Toxicity Chemical Analysis.

4. REFERENCES

A. USATECOM Regulation 385-6, Verification of Safety of Materiel During Testing.
B. USATECOM Regulation 700-1, Value Engineering.
C. USATECOM Regulation 705-4, Equipment Performance Report.
D. MIL-STD-810B, Environmental Test Methods.
E. Small Development Requirements (SDR) 149f (4) CDOG. Prisoner of War Name Identification Kits.
F. USAGETA, Human Factors Evaluation Data for General Equipment.
G. American Society for Testing and Materials (ASTM) D2244-68, Instrumental Evaluation of Color Differences of Opaque Materials, Test for.
H. MTP 10-2-500, Physical Characteristics.
I. MTP 10-2-501, Operator Training and Familiarization.
J. MTP 10-2-502, Durability
K. MTP 10-2-503, Surface Transportability (General Supplies and Equipment).
L. MTP 10-2-505, Human Factors Evaluation.
M. MTP 10-2-507, Maintenance Evaluation
N. MTP 10-2-508, Safety.

5. SCOPE

5.1 SUMMARY

This MTP describes the following tests:

a. Preparation for Test - A determination of the condition of the test item upon arrival, its physical characteristics, and the requirements for operator training and familiarization.

b. Material Characteristics - A determination of the characteristics of the test item materials upon arrival.

c. Performance Tests - An evaluation to determine that the test item meets its technical performance requirements, including the proper operation of associated equipment.

d. Environmental Tests - An evaluation to determine the ability of the test item to perform satisfactorily after exposure to various controlled environmental conditions.

e. Shock Test - A determination of the ability of the test item and associated equipment to resist damage in the unpackaged condition.

f. Safety - An evaluation to determine the safety characteristics and hazards of the test item.

g. Maintainability and Reliability Evaluation - That portion of the test which is concerned with the following: verification and appraisal of failures; determination and appraisal of maintenance characteristics and requirements; appraisal of design-for maintainability; appraisal of the

BLANK PAGE

maintenance test package; and, calculation of indicators which express the effects of the preceding aspects.

h. Transportability - An evaluation to determine if test item is capable of withstanding the shock and vibration encountered during normal handling and transporting conditions.

i. Human Factors Evaluation - An evaluation to determine the adequacy of the design and performance characteristics of the item and its associated equipment in terms of conformance to appropriate human factors engineering design criteria.

j. Value Analysis - An evaluation to determine the features of the test item that are unnecessary, costly or "nice-to-have".

5.2 LIMITATIONS

None.

6. PROCEDURES

NOTE: During installation and operation, the operating techniques provided in the manufacturer's instruction manual or draft technical manual will be used. Any change or deviation from these instructions will be recorded in the test item logbook.

6.1 PREPARATION FOR TEST

6.1.1 Initial Inspection

Upon receipt of the test item at the test site, the test item shall be subject to the following procedures:

a. Visually inspect the test item package(s) and record the following:

1) Evidence of packaging damage or deterioration
2) Identification markings, including:

a) Name of contractor
b) Date of manufacture
c) Other markings pertaining to the test item

b. Weigh and measure the individual package(s) of the test item and its accessories and record the following:

1) For each shipping package:

a) Contents
b) Weight
c) Length, width, and height
d) Cubage

2) For the entire test item:

a) Weight
b) Cubage

c. Unpack the test item, visually inspect it and record the following when applicable:

1) Evidence of defects:

a) Manufacturing
b) Material
c) Workmanship

2) Evidence of damage
3) Evidence of wear

NOTE: Make use of photographs, diagrams, and narration to indicate the condition of the test item.

d. Presence of instruction plates, if applicable, including:

1) Identification, name and serial number
2) Caution instructions.
3) Service instructions

e. Existence of shortages.

6.1.2 Physical Characteristics

Determine and record the physical characteristics of the test item as described in the applicable sections of MTP 10-2-500.

6.1.3 Operator Training and Familiarization

Orient test personnel using the criteria of MTP 10-2-501 and record all pertinent data.

6.2 TEST CONDUCT

NOTE: Report all equipment failures by preparing an Equipment Performance Report (EPR) in accordance with USATECOM Regulation 705-4.

6.2.1 Material Characteristics

Determine and record the material characteristics of the test item as described in the applicable sections of MTP 10-2-500 for the following:

a. Abrasion
b. Tear Strength
c. Break Strength
d. Puncture

e. Elongation
f. Hardness
g. Brittleness

6.2.2 Performance Tests

6.2.2.1 Tensile Strength and Elongation Tests

a. Join the two ends of the identification band together, using the attaching device provided with the identification kit.

b. Place the identification band in the tensile tester and establish the intitial point on the elongation scale. Apply the stress at a rate which will permit observation of any yield, and fracture of the identification band.

c. Record the following, using photographs or diagrams as necessary:

1) Method of joining.
2) Position of joint relative to tester grips.
3) Method and rate of applying stress.
4) Stress, elongation, and elapsed time from start of stressing to disfigurement.
5) Stress, elongation, and elapsed time from start of stressing to complete fracture.
6) Location of break in the identification band.

d. Repeat steps a through c, but with the force applied immediately before and after the point of attachment of the two ends of the identification band.

e. Repeat steps b and c, but with the band unjoined.

f. Repeat steps a through e until each test has been performed on at least six bands.

6.2.2.2 Color Difference

NOTE: This test will be performed when color-coded name slips are included in the test item.

a. Select a reference specimen and quantitatively compare similar color-coded name slips, using a color difference meter. Record identification of color difference meter.

b. Obtain reflectance and gloss measurements for each similar color name slip.

c. Record the following:

1) Color/identity of reference specimen
2) Color scale used
3) Reflectance of test specimen

4) Gloss measurement of test specimen
5) Color of test specimen
6) Color difference meter reading

d. Repeat steps a through c for each different color as required.

NOTE: Retain reference specimen for use if required for Durability, Water Resistance, and Environmental tests in paragraph 6.2.2.3, 6.2.2.5, and 6.2.3.

6.2.2.3 Durability

Determine the durability of the test item as described in the applicable sections of MTP 10-2-502 and the following:

a. Print a variety of forty symbols in two lines of twenty each on each color name slip with the alphanumerical printing device supplied with the identification kits.
b. Attach name slip to the identification bands, if applicable.
c. Record any difficulties encountered while printing or inserting name slips.
d. Join the two ends of the identification band together.
e. Record the difficulties encountered in joining the two ends.
f. Place the bands out of doors unprotected so they are exposed to weather.
g. Inspect the bands every three months, for a period of one year and record the following:

1) Any discoloration of the name slips.

NOTE: If required, repeat the Color Difference test in Section 6.2.2.2.

2) Any separation between name slips and identification bands.
3) Looseness or parting of the two joined ends of the identification bands.
4) Any disfiguration of name slip including the letters and numbers.
5) Legibility of data on name slip.

NOTE: The legibility of data on the name slip will be determined at a specified distance, based on the results obtained from paragraph 6.2.2.6 (Legibility).

6) Elapsed time from begining of the test.

6.2.2.4 Toxicity

a. Perform a standard allergenic and toxicity chemical analysis on the identification band.
b. Record any indications that a health hazard may exist to the

wearer or the personnel attaching the band.

6.2.2.5 Water Resistance

a. Place a joined identification band with an inserted printed name slip in water.
b. Place one of each color name slips in water.
c. Inspect the items every day for the first two weeks and every week thereafter for two months.
d. Record the following:

1) Any change in color of name slips

NOTE: If required, repeat the Color Difference test in Section 6.2.2.2.

2) Any deterioration of the identification band or name slip.
3) Any change in the alphanumerical symbols.
4) Breakdown of any adhesives used on the identification bands.
5) Elapsed time since test beginning

6.2.2.6 Legibility

NOTE: Test personnel shall have normal visual acuity and color perception.

a. Place a name slip with printing on both lines in an identification band.
b. Attach the band to a holder in a brightly illuminated room.
c. Determine and record the illumination using a light meter.
d. Test personnel shall observe the name slip form a position perpendicular to the name slip, at the greatest possible reading distance (e.g.: Maximum for optical resolution). The observer shall attempt to spell out the name (or character sequence).
e. Test personnel shall then move forward step-by-step, spelling out the name at each step until the recording personnel determine that the printing is clearly legible.
f. Record the following:

1) Color of name slip.
2) Maximum distance between the observer and the name slip when clearly legible.
3) Angular position of observer, to left or right of the normal from the name slip.
4) Any difficulty in legibility attributed to the lettering device.

g. Repeat steps c through f for varied angular position of observer, up to 90° either side of the normal from the name slip.
h. Repeat steps c through g for different levels of illumination.
i. Repeat steps c through h for each color name slip to be used.

6.2.3 Environmental Tests

NOTE: 1. Standard ambient conditions are:

Temperature 23° ± 10 C
Relative humidity 50 ± 3 percent
Atmospheric pressure 610 to 775 mm of mercury

2. No maintenance shall be performed during environmental tests.

6.2.3.1 High Temperature

a. Place test item in a humidity-temperature chamber.
b. Raise the internal temperature to 71°C and a maximum of 15 percent relative humidity and maintain it for 48 hours or as stated in test item specifications.
c. Return chamber to the highest operating temperature specified for the test item.
d. Perform the applicable procedures of the performance tests (see paragraph 6.2.2).
e. Return chamber to standard ambient conditions.
f. After stabilization, repeat step d.
g. Record any damage to test item due to temperature.

6.2.3.2 Low Temperature

a. Place test item in a humidity-temperature chamber.
b. Lower the internal temperature to -22°C or as specified.
c. Maintain temperature for a period of at least 24 hours or as stated in test item specifications.
d. Return chamber to the lowest operating temperature specified for the test item.
e. Repeat steps 6.2.3.1d through g.

6.2.3.3 Humidity

a. Place test item in a humidity-temperature chamber.
b. Dry test item 54°C for 24 hours.
c. Condition at 23°C and 50 percent relative humidity for 24 hours.
d. Perform the applicable procedures of the performance tests (see paragraph 6.2.2).
e. Raise internal temperature to 30°C.
f. Subject the test item to 5 continuous 48 hour cycles in accordance with Figure 1.
g. Relative humidity shall be kept at 95 percent or as stated in test item specifications.
h. Repeat the applicable performance tests of paragraph 6.2.2 where indicated in Figure 1 or as stated in test item specifications.

NOTE: 1. Accumulated moisture may be removed by turning or shaking

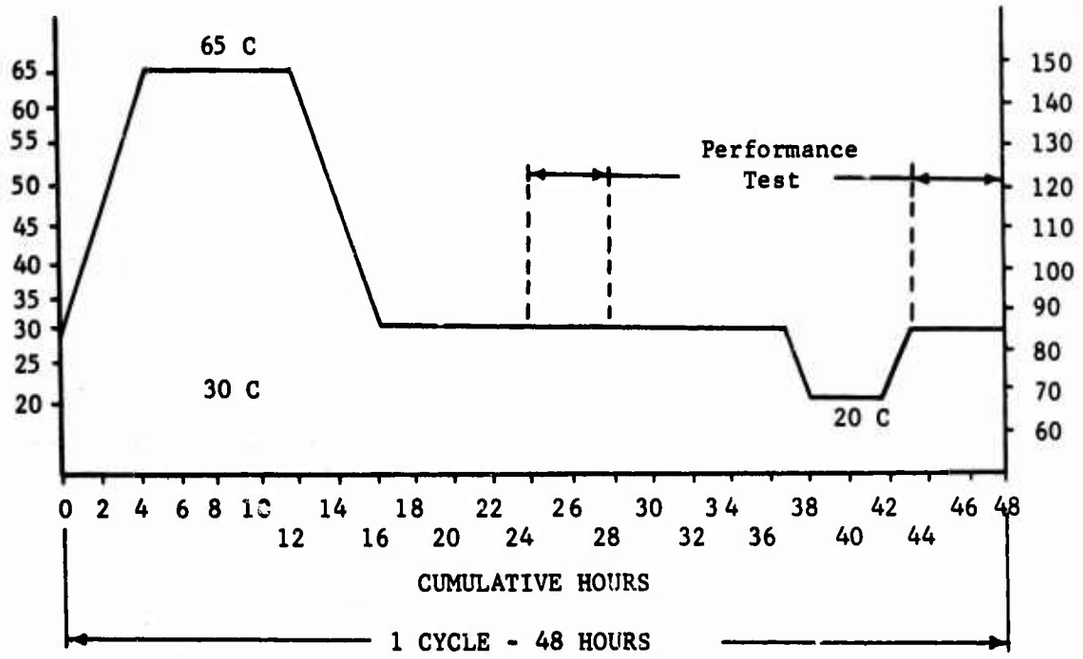

Figure 1. Humidity Cycle

test item.
2. Wiping is not permitted.

i. Return chamber to 23°C and 50 percent relative humidity and condition test item for 24 hours.
j. Repeat the applicable performance tests of paragraph 6.2.2.
k. Record any damage to test item due to humidity.

6.2.4 Shock Test

a. Place test item on firm bench top.
b. Using one edge of the test item as an axis, raise the test item through an angle of 30 degrees.

NOTE: Make use of photographs to indicate axis used for shock test.

c. Record the edge that was used as an axis.
d. Drop equipment back to a horizontal position.
e. Perform the applicable procedures of the performance tests. (See paragraph 6.2.2).
f. Repeat steps b and c using all practicable edges of test items.
g. Record any broken or damaged parts due to shock test.

6.2.5 Safety

a. Determine the safety characteristics of the test item by performing the applicable sections of MTP 10-2-508.
b. Inspect the test item and record any conditions that might present a safety hazard and the procedure necessary to alleviate the hazard.

6.2.6 Maintainability and Reliability Evaluation

Evaluate the maintenance-related factors of the test item as described in MTP 10-2-507 with emphasis on the following:

a. Organizational (O), Direct Support (F), and General Support (H) Maintenance Requirements.
b. Operator through General Support Maintenance Literature.
c. Repair parts.
d. Tools.
e. Test and handling equipment.
f. Calibration and maintenance facilities.
g. Personnel skill requirements.
h. Maintainability.
i. Reliability.
j. Availability.

6.2.7 Transportability

a. Subject the test item to the applicable drop and vibration tests described in MTP 10-2-503.

b. Upon completion of each test perform the following:

1) Visually inspect the test item and record all evidence of damage.
2) Photograph all damaged components.
3) Verify the ability of the name slip printing device and the identification band joining device to perform their respective functions.

6.2.8 Human Factors Evaluation

Determine the effectiveness of the man-item relationship during operational use of the test item. Simplicity, and effort in installing, operating, and maintaining the test item will be evaluated as prescribed in MTP 10-2-505 and as follows:

Observe and record the following:

a. Accessibility of components
b. Ease of attaching and adjusting band
c. Ease of marking names on bands
d. Portability

6.2.9 Value Analysis

Throughout the test, test personnel will observe and record any unnecessary, costly, or "nice-to-have" features of the test item, as stated in USATECOM Regulation 700-1.

6.3 TEST DATA

6.3.1 Preparation For Test

6.3.1.1 Initial Inspection

Record the following:

a. Evidence of package damage or deterioration
b. Identification markings, including:

1) Name of contractor
2) Date of manufacture
3) Other pertinent markings

c. For each shipping package:

1) Contents

2) Weight, in pounds
3) Overall dimensions, in feet and inches, of:

a) Length
b) Width
c) Height

4) Cubage, in ft^3

d. For the entire test item:

1) Weight, in pounds
2) Cubage, in ft^3

e. Evidence of defects in unpacked test item:

1) Material
2) Construction
3) Workmanship

f. Evidence of damage
g. Evidence of wear
h. Presence of instruction plates, including:

1) Identification plate
2) Caution instruction plate
3) Service instruction plate

i. Shortages

6.3.1.2 Physical Characteristics

Record data as required by MTP 10-2-500.

6.3.1.3 Operator Training and Familiarization

Record pertinent data as described in applicable sections of MTP 10-2-501.

6.3.2 Test Conduct

6.3.2.1 Material Characteristics

Record data as described in applicable sections of MTP 10-2-500.

6.3.2.2 Performance Tests

6.3.2.2.1 Tensile Strength and Elongation Tests -

a. Record the following:

1) Configuration of test item (ends joined, ends unjoined).
2) Method of joining, if applicable.
3) Position of joint relative to tester grips.
4) Method and rate of applying stress.
5) Stress, elongation, and elapsed time from start of stressing to disfigurement.
6) Stress, elongation, and elapsed time from start of stressing to complete fracture.
7) Location of break in the identification band.

b. Retain all photographs and diagrams

6.3.2.2.2 Color Difference -

a. Record the following for each test condition or series of tests:

1) Identity of color difference meter (Manufacturer's name, model number).
2) Color scale used.

b. Record the following for each color-coded name slip tested:

1) Color/identity of reference specimen
2) Reflectance of test specimen
3) Gloss measurement of test specimen
4) Color of test specimen
5) Color difference meter reading

6.3.2.2.3 Durability -

a. Record the following for each band at the beginning of test:

1) Any difficulties encountered while printing or inserting name slip.
2) Any difficulties encountered in joining the two ends of the identification band.

b. Record the following for each band for each inspection:

1) Any discoloration of the name slip.
2) Any separation between name slip and identification band.
3) Looseness or parting of the joined ends of the identification band.
4) Any disfiguration of name slip, including the alphanumeric symbols.
5) Legibility of data on test item.
6) Elapsed time from the beginning of the test in months, and days.

6.3.2.2.4 Toxicity -

Record any results of the chemical analysis that indicates a health hazard may exist to the wearer or the personnel attaching the band.

6.3.2.2.5 Water Resistance -

Record the following:

a. Elapsed time since beginning of test in months, days and hours.
b. Any change in color of the name slip.
c. Any deterioration of the identification band or name slip.
d. Any change in the alphanumerical symbols.
e. Breakdown of any adhesives used on the identification band.

6.3.2.2.6 Legibility -

Record the following for each identification band and for each test condition:

a. Illumination.
b. Color of name slip.
c. Distance of test personnel from name slip.
d. Position of test personnel.
e. Any difficulties in legibility due to the alphanumerical lettering device.

6.3.2.3 Environmental Tests

Record the following for each portion of the environmental test:

a. Environmental test performed (high temperature, low temperature, or humidity).
b. Environmental conditions during performance tests:

    1) Temperature in °C
    2) Humidity in percent
    3) Atmospheric pressure in mm of Hg

c. Performance data collected as described in paragraph 6.2.2.
d. Damage to the test item due to environmental test condition.

6.3.2.4 Shock Test

a. Record the following for each edge of test item:

    1) Axis used for shock test
    2) Performance data collected as described in paragraph 6.2.2.
    3) Any broken or damaged parts due to shock

b. Retain all photographs

6.3.2.5 Safety

Record the following:

a. Data collected as described in applicable sections of MTP 10-2-508.

b. Any condition that might present a safety hazard and procedure necessary to alleviate the hazard.

6.3.2.6 Maintainability and Reliability Evaluation

Record data collected as described in the applicable section of MTP 10-2-507.

6.3.2.7 Transportability

a. Record data as described in the applicable sections of MTP 10-2-503 and the following:

1) Identity of test performed
2) Evidence of damage
3) Inability of devices to perform their functions, if any

b. Retain all photographs.

6.3.2.8 Human Factors Evaluation

Data shall be recorded as described in applicable sections of MTP 10-2-505 and the following:

a. Accessibility of components
b. Ease of attaching and adjusting band
c. Ease of marking names on bands
d. Portability

6.3.2.9 Value Analysis

Record the following:

a. Unnecessary features
b. Costly features
c. Nice-to-have features

6.4 DATA REDUCTION AND PRESENTATION

Data obtained during the testing procedure will be summarized and evaluated to determine the extent the test item meets its technical requirements. Results will be presented as charts, tabulations, or graphs as appropriate for all tests including the following:

6.4.1 Environmental Tests

Tabulate the data and compare results with the Performance Test Data in 6.3.2.2. Tabulate major changes in performance caused by the environmental tests.

6.4.2 Safety

A preliminary report shall be submitted in accordance with USATECOM Regulation 385-6, based on the data collected relative to safety.

6.4.3 Transportability

Tabulate the accelerometer readings for each axis, for each drop of the transit drop test, and the effects of shock and vibration on the test item's operability.