

MIL-S-21711E
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SUPERSEDING
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MILITARY SPECIFICATION

SHOES, WOMEN'S

This specification is approved for use by the Navy Clothing and Textile Research Facility, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope This specification covers the requirements for a woman's low dress black oxford shoe.

1.2 Classification The shoes shall be of one type only and in the following sizes and widths as specified (see 6.2).

Sizes: 3 to 12 inclusive, in whole and half sizes
Widths: AAAAA to EE inclusive

2. APPLICABLE DOCUMENTS

2.1 Government documents

*2.1.1 Specifications, standards and handbooks Unless otherwise specified the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation form a part of this specification to the extent specified.

SPECIFICATIONS

FEDERAL

| | |
|-----------|---------------------|
| - V-L-61 | - Laces, Nylon |
| - V-T-276 | - Thread, Cotton |
| - V-T-285 | - Thread, Polyester |

Beneficial comments (recommendations, additions, and deletions) and any pertinent data which may be of use in improving this document should be addressed to: Officer in Charge, Navy Clothing and Textile Research Facility, 21 Strathmore Road, Natick, MA 01760 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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| | |
|-----------|---|
| V-T-295 | - Thread, Nylon |
| KK-I-570 | - Insole, Footwear, Leather, Cattlehide |
| KK-W-231 | - Welting, Leather, Shoe |
| ZZ-H-141 | - Heels, Rubber |
| PPP-B-636 | - Box, Shipping, Fiberboard |
| PPP-B-566 | - Box, Folding, Paperboard |
| PPP-B-676 | - Boxes, Setup |

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|-------------|--|
| MIL-S-40043 | - Soles, Rubber, Shoe |
| MIL-C-41814 | - Counter, Footwear |
| MIL-L-21635 | - Last, Footwear (Shoe, Woman's Oxford). |

STANDARDS**FEDERAL**

| | |
|-------------|--|
| FED-STD-191 | - Textile Test Methods |
| FED-STD-311 | - Leather, Methods of Sampling and Testing |
| FED-STD-751 | - Stitches, Seams, and Stitchings |

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|-------------|---|
| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by Attributes |
| MIL-STD-129 | - Marking for Shipment and Storage |

(Copies of specifications, standards, drawings and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.1.2 Other Government publications The following Government publication forms a part of this specification to the extent specified herein.

LAWS AND REGULATIONS**US POSTAL SERVICE MANUAL**

(Copies of the manual may be obtained from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)

*** 2.1.3 Order of precedence** In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

*** 2.2 Other publications** The following documents form a part of this specification to the extent specified herein.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|-------|---|
| D-412 | -Rubber Properties in Tension |
| D-746 | -Brittleness Temperature of Plastics and Elastomers by Impact |

- D-790 - Flexural Properties of Plastics and Electrical Insulating Materials
- D-792 - Specific Gravity of Plastics by Displacement
- D-1708 - Tensile Properties of Plastics by use of Microtensile Specimens
- D-2240 - Rubber Property - Durometer Hardness

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103).

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT
National Motor Freight Classification

(Application for copies should be addressed to American Trucking Association, Inc., Traffic Department, 1616 P Street, NW, Washington, DC 20036).

UNIFORM CLASSIFICATION COMMITTEE, AGENT
Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, ILL 60606).

3. REQUIREMENTS

3.1 Guide sample Samples, when furnished, are solely for guidance and information to the contractor (see 6.3). Variation from this specification may appear in the sample, in which case this specification shall govern.

***3.2 First article** When a first article inspection is required, the items will be tested and should be a first article sample. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, quantity, and testing and approval of the first article (see 4.2).

3.3 Material

***3.3.1 Upper leather** The uppers shall be cut from full grain, smooth finish chrome tanned calfskin. As an alternate, full grain or partially corrected grain, chrome tanned kip or cattlehide leather may be used. The leather shall be drum dyed black and the color shall penetrate from both sides of the leather. When calfskin is used, the thickness shall be 1 3/4 to 3 ounces and the area of a side shall not exceed 20 square feet. When kip leather is used, the thickness shall be 3 to 4 ounces and the area of a side shall not exceed 17 3/4 square feet. When cattlehide leather is used, the thickness shall be 3 to 4 ounces and the area of a side shall not exceed 28 square feet. The break in leather shall be no more than a break scale of 3 when calfskin is used and no more than a break scale of 4 when cattlehide or kip leather is used. Defects affecting the grain surface of the cut vamp or quarter shall not appear in the uppers. Leather defects shall be classified and scored in accordance with 4.3.1.1.3.

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3.3.2 Quarter linings, tongue linings, and heel pads The quarter linings, tongue linings, and heel pads shall be cut from a soft, chrome tanned, full grain or corrected grain cattlehide glove leather or pigskin leather. Defects that may affect serviceability are not permitted. The color shall be gray and the thickness shall be 2 to 3 1/2 ounces. The lining pieces shall be assembled with the grain side facing the wearer's foot. The leather heel pad shall cover the entire heel seat area and extend a minimum of 1/2 inch beyond the front edge of the fiberboard heel tuck. Testing shall be as specified in 4.3.1.

***3.3.2.1 Fungicide treatment** Leather components do not require a fungicide treatment. However, when used, leather components shall contain not more than 0.70 percent paranitrophenol fungicide when tested as specified in 4.3.1.

***3.3.3 Outsole, rubber** The outsole shall be black, 10 (+ 1/2) irons in thickness conforming to type I, Class 1 of MIL-S-40043. The tread area of the outsole shall be smooth. The sole may be cut from sheet stock and the size, manufacturer's name or trademark need not be marked on the bottom of outsole.

***3.3.4 Insoles**

3.3.4.1 Leather insoles Leather insoles shall conform to type I, class 2, tannage a or b of KK-I-570. The thickness shall be a minimum of 4 1/2 irons and a maximum of 5 1/2 irons. The requirements for paranitrophenol shall not apply.

***3.3.4.2 Synthetic insoles** The insoles may be cut from a synthetic material that is sold commercially as "TEXORIST". The synthetic materials shall contain 0.25 to 1.00 percent copper - 8 quinolinolate uniformly distributed throughout the insole. The insole shall be 0.116 (+ 0.010) inch thick. The insole shall be cut with the heel-to-toe direction across the machine direction of the synthetic material. The synthetic insole shall have a stuck-on-rib applied to the printed side of the material (see 6.5).

***3.3.5 Welting**

3.3.5.1 Leather welting Leather welting shall be 1/8 inch in thickness and shall conform to the requirements of KK-W-231.

3.3.5.2 Synthetic welting Synthetic welting shall be of a flat top design in a suitable configuration. The color shall be black with a semi-bright to bright finish. The welting shall be of sufficient width to assure that the required finished sole extension of 1/8 inch is met. The thickness of the welting shall be 0.12 to 0.13 inch. The base compound shall be polyvinyl chloride or a blend of polyvinyl chloride and nitrile rubber. The finished welting shall be smooth, flexible, uniform in texture, and free of blemishes, cracks, blisters, and other defects that might affect serviceability or appearance. The synthetic welting shall conform to the following requirements when tested as specified in 4.3.1.

| <u>Property</u> | <u>Requirement</u> |
|-----------------------|----------------------------|
| Hardness | 85-95 |
| Specific gravity | 1.32 maximum |
| Brittle point | -15 ⁰ F or less |
| Tensile strength, psi | 2100 minimum |
| Elongation, percent | 225 minimum |

3.3.6 Fabrics

*3.3.6.1 Vamp lining The vamp lining shall be a cotton twill fabric conforming to the requirements of Table I. The fabric shall be natural or bleached and the starch and protein content, including chloroform-soluble and water-soluble material, shall not be greater than 15 percent, based on the weight of the fabric. Testing shall be as specified in 4.3.1.

Table I - Cotton twill requirements

| Weight per sq yd (min) Oz. | Threads per inch (min) | | Breaking strength (min) | | Weave |
|-------------------------------------|------------------------------|---------|----------------------------|---------|-----------------------------|
| | Warp | Filling | Warp | Filling | |
| | | | Lbs. | Lbs | |
| 10 | 85 | 38 | 130 | 125 | 3/1 twill or herringbone |

3.3.6.2 Quarter and vamp plug doublers (when calfskin is used) The quarter and vamp plug doublers shall be cut from a single napped cotton flannel weighing not less than 5.7 ounces per square yard. The finished fabric shall have a minimum of 36 warp threads and 36 filling threads per inch and shall have a minimum breaking strength of 30 pounds in the warp and 30 pounds in the filling. The starch and protein content including chloroform-soluble and water-soluble material shall not be greater than 15 percent based on weight of the fabric. The color of the fabric shall be natural, or bleached. Testing shall be as specified in 4.3.1. As an alternate, the material specified in 3.3.6.1 may be used. NOTE: Quarter and vamp doublers are not required when kip or cattlehide leather is used.

3.3.6.3 French cord The quarter top seam binding shall be 3/8 (+ 1/32) wide and shall weigh 7.0 to 9.0 ounces per gross yard. The binding shall have a nylon warp and cotton filling with woven edges. The binding shall be dyed black and have a minimum of "good" colorfastness to crocking. Testing shall be as specified in 4.3.1.

3.3.6.4 Heel pad, felt The heel pads shall be white felt weighing not less than 5 ounces per square yard and of sufficient size to cover the entire heel seat area and front edge of fiberboard heel tuck. Testing shall be as specified in 4.3.1.

3.3.6.5 Eyelet stays The eyelet stays shall be a compressible adhesive fiber tape or a stiff starched cotton stay-duck weighing approximately 8 ounces per square yard. The minimum width of stays shall be 1/2 inch. Testing shall be as specified in 4.3.1. Eyelet stays are not required when calfskin uppers are used.

3.3.6.6 Insole, stuck-on rib The finished rib shall consist of a combination of coated fabric and fiberboard materials. The rib shall be 7/32 to 8/32 inch high with a minimum width of 5/8 inch when measured from the inside vertical portion of the rib, and shall extend around the periphery of the insole from score line to score line. The fabric used for the stuck-on rib shall be cotton or cotton/synthetic conforming to the requirements of Table II. The fabric shall be coated on one side with a suitable adhesive and bonded to the flesh side of the leather insole or the printed side of the synthetic insole. The fiberboard and fabric shall cover 4/32 to 6/32 inch of the peripheral edge, and provide for the required edge extension of the finished shoe.

Table II - Rib fabric requirements

| Weight, ounces per sq. yd. (min) | Yarns per inch (min) | | Breaking strength, lbs. | |
|-------------------------------------|----------------------|---------|-------------------------|---------|
| | Warp | Filling | (min) Warp | Filling |
| 8.0 | 52 | 30 | 105 | 105 |

3.3.6.6.1 Rib strength The physical requirements for the stuck-on rib shall conform to Table III when tested as specified in 4.3.3.2.

Table III - Rib strength requirements

| Characteristic | Minimum <u>1/</u> | Average <u>1/</u> |
|-----------------------|-------------------|-------------------|
| Shear strength, lbs. | 70 | 75 |
| Stitch strength, lbs. | 20 | 30 |

1/ No single determination shall fall below the minimum specified and the average of all specimens shall not be less than the average specified.

3.3.7 Counters

3.3.7.1 Counters, molded The molded counters shall conform to the requirements of MIL-C-41814 for Shoe, Woman's, Black, Oxford. When automatic back part lasting is used the counter material shall conform to 3.3.7.2.

***3.3.7.2 Counters, sheet** The counter material shall be an extruded ionomer resin sheet with a heat activated adhesive on both sides. The thickness of the extruded sheet shall be 0.045 (+ 0.003) inches. The thickness of the adhesive coating on each side of the sheet shall be 0.003 to 0.006 inches. The color of the ionomer resin shall be suitable for the purpose intended. Counters cut from the sheet material shall be sized properly to fill the counterpocket of the shoe. The sheet material shall conform to the following requirements when tested as specified in 4.3.1.

| <u>Property</u> | <u>Requirement</u> |
|------------------|--------------------|
| Specific gravity | 0.955 + .015 g/cc |
| Tensile strength | 4000 + 500 PSI |
| Elongation | 250% minimum |
| Flex modulus | 50,000 + 5000 PSI |
| Brittle point | -60°C maximum |

3.3.8 Box toe The box toe material shall conform to either 3.3.8.1 or 3.3.8.2.

*3.3.8.1 Impregnated box toe The box toes shall be formed with a woven flannel or processed needle punched base fabric impregnated with a pyroxylin or polystyrene compound. The box toes shall be either an activated or prepared type. The material shall be 0.050 (+ 0.005) inch thick. The box toes shall be of a shape and size to engage the insole rib after lasting and support the toe portion and part of the vamp plug, approximately 1/4 inch back of the stitching. The box toes shall be skived at the breastline only. Testing shall be as specified in 4.3.1.

*3.3.8.2 Laminated box toe When automated lasting is used the laminated box toe may be made of virgin ionomer resin (SURLYN) laminated with any combination of flannel fabric, flannel or nonwoven fabric or either or both sides. The combined thickness of the lamination shall be 0.040 (+ 0.004) inch (see 6.5). Testing shall be as specified in 4.3.1.

3.3.9 Bottom filler The bottom filler shall be either thermoplastic or cold process type conforming to the following requirements:

3.3.9.1 Thermoplastic bottom filler The thermoplastic type shall consist of a mixture of ground cork and a suitable thermoplastic binder, with a minimum of 2 3/4 parts by volume of cork to each part of binder. The cork granules shall be free from bark. The ground cork and binder shall be thoroughly and evenly mixed. The binder shall be water insoluble. The binder shall have a softening point of at least 125°F (51.0°C) and a maximum penetration of 85mm with a 200 gram load for 60 seconds at 77°F (250°C). Testing shall be as specified in 4.3.1.

3.3.9.2 Cold process bottom filler The cold process type shall be spreadable without the use of heat. It shall consist of a mixture of ground cork and a suitable binder in the proportion of two parts cork to each part of binder by volume. The cork granules shall be free from bark. When the spread filler is dry and set, it shall consist of four parts cork to one part binder. The binder shall be water insoluble and have a softening point of at least 150°F (66°C). Testing shall be as specified in 4.3.1. As an alternate, a cold process bottom filler applied by semi-automatic equipment or other suitable method may be used. The alternate filler shall consist by weight of a mixture of one part ground cork to five parts suitable binder. Upon loss of solvent, the alternate filler shall consist by weight of one part cork to 3 3/4 parts binder. The binder shall be water-insoluble and have a softening point of at least 125°F (51.8°C) when tested as specified in 4.3.1.

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3.3.10 Shanks

3.3.10.1 Steel shank The steel shank, without shankboard, shall be made from 18 gage (.050 + .003 inch) cold rolled carbon steel with a Rockwell C scale hardness ranging from 45-54 and shall be shaped to conform to the arch of the MIL-W-1 last. The width of the shank shall be $5/8$ (+ $1/64$) inch. The shank shall be made with a single or double rib and the overall thickness at the highest point of the rib shall be .080 to .125 inch. The rib shall taper off 1 (+ $1/8$) inch from the heel and $1/2$ (+ $1/8$) inch from the toe. The toe end of the shank shall be rounded and the heel end shall have a $5/8$ (+ $1/8$) inch deep slot and two holes for stapling and tacking. The shank lengths shall be as indicated in table IV and testing shall be as specified in 4.3.1.

***3.3.10.2 Fiberglass shank** As an alternate, a fiberglass shank, without shankboard, may be used. The shank shall consist of glass fibers impregnated with vinylester resins encased in a plastic sleeve or tube. The width of the uncured encased fiberglass resin shall be $5/8$ (+ $1/32$) inch. The shank shall be cured and bonded to the insole and shall conform to the shape of the last. When fully cured the shank shall be $5/8$ (+ $1/16$) inch in width. The toe end of the fiberglass shank shall have a $1/2$ (+ $1/8$) inch taper and the heel end shall be tapered for a minimum of $3/8$ inch. The shank lengths shall be as indicated in table IV and testing shall be as specified in 4.3.1 (see 6.6).

Table IV - Schedule of shank sizes 1/

| Shoe sizes (all widths) | | Shank length (inches) | |
|-------------------------|--------|-----------------------|---------|
| 3 | 5 | 4 | 4 $3/8$ |
| 5 1/2 | 6 1/2 | 4 1/4 | 4 $5/8$ |
| 7 | 8 | 4 1/2 | 4 $7/8$ |
| 8 1/2 | 9 | 4 3/4 | 5 $1/8$ |
| 9 1/2 | 10 1/2 | 5 | 5 $3/8$ |
| 11 | 12 | 5 1/4 | 5 $5/8$ |

1/ When required, the shank length shall be modified to accommodate smaller sizes to assure proper fitting.

3.3.11 Adhesives The adhesives used for bonding the various parts of the shoes shall be one of the following types and suitable for the purpose intended:

- Natural rubber latex
- Synthetic rubber latex, including chloroprene
- Natural rubber solvent cement
- Synthetic rubber solvent cement
- Synthetic resin cements

3.3.12 Heel tuck The heel tuck shall be made of fiberboard 4 to 5 irona in thickness and shall cover the entire heel seat area. The front edge of the heel tuck shall be skived. Testing shall be as specified in 4.3.1.

3.3.13 Heel base for junior heel The heel base used with the junior heel shall be molded from black polyethylene resin having a specific gravity of between 0.910 and 0.940 and shall contain no filler except for the black color pigment. The plastic heel base shall have a hardness range of 44-60 and shall be free of cracks, blisters, porosity, and other defects that might affect serviceability or appearance. The heel base shall be of sufficient height to provide for a finished heel height of 1 (+ 1/32) inch. The heel base shall be solid or of hollow center design. When hollow center design is employed, at least one bar from center to breast or outer perimeter is required. All nails shall be surrounded by plastic when heel and heel base are matched for nailing. Testing shall be as specified in 4.3.1. The size of heel bases shall be in accordance with Table V.

*3.3.14 Heels, rubber The rubber heels shall conform to Type II (whole heel) class 7 or type III (junior heel) class 3, color No. 1 of ZZ-H-141, except that the abrasive index shall be not less than 150. The breastline of the heel shall be straight or curved. The size of junior heels shall be in accordance with Table V. The size of the whole heels (length and width dimensions) shall be similar to the junior heels.

Table V - Heels and Heel Base Sizes for Junior Heels 1/

| Heel Sizes | J10 | J11 | J12 | J13 | J14 | J15 | J16 |
|-----------------|-------|-------|-------|-------|--------|--------|-------|
| Heel Base Sizes | 8 | 9 | 10 | 3C | 6C | 8C | 10C |
| Shoe Width | | | | | | | |
| AAAAA | 3½-4½ | 5-6 | 6½-7½ | 8-9 | 9½-10½ | 11-12 | - |
| AA-AAAA | 3 | 3½-4½ | 5-6 | 6½-7½ | 8-9 | 9½-10½ | 11-12 |
| A-C | | 3 | 3½-4½ | 5-6 | 6½-7½ | 8-9 | 9½-12 |
| D-E | | | 3 | 3½-4½ | 5-6 | 6½-7½ | 8-12 |
| EE | | | | 3 | 3½-4½ | 5-6 | 6½-12 |

1/ When required, heel and heel base sizes shall be modified to accommodate smaller shoe sizes.

3.3.15 Thread

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3.3.15.1 Thread, upper fitting Thread used for upper fitting shall be either cotton or nylon as specified in 3.3.15.1.1 and 3.3.15.1.2.

3.3.15.1.1 Thread, cotton The upper fitting cotton thread shall conform to type IA3 or IB3, ticket No. 40, 4 ply of V-T-276. The color shall be black and colorfastness requirements shall not apply. The bobbin or looper thread may be natural.

3.3.15.1.2 Thread, nylon The upper fitting nylon thread shall conform to type I or II, class 1 or type III, size B or B of V-T-295. The color shall be black and colorfastness requirements shall not apply. The bobbin or looper thread may be natural.

3.3.15.2 Thread, sole stitching Thread used for sole stitching shall be either cotton or polyester as specified in 3.3.15.2.1 and 3.3.15.2.2.

3.3.15.2.1 Thread, cotton The sole stitching thread shall be cotton conforming to type IVA or IVB of V-T-276. The needle thread shall be black, ticket No. 8, 4 or 6 ply. The bobbin thread shall be natural, ticket No. 8, 5 ply. Colorfastness requirements shall not apply.

3.3.15.2.2 Thread, polyester The sole stitching thread shall be polyester conforming to type I, class 1, subclass C of V-T-285. The machine or running thread shall be black, size 8 with 3 or 5 ply. The bobbin thread shall be natural, size 8, 3 or 5 ply. Colorfastness requirements shall not apply.

3.3.15.3 Thread, inseaming The thread used for inseaming shall be natural color polyester conforming to type I, class 1, subclass C, size 8, 3 or 5 ply of V-T-285.

3.3.16 Eyelets The eyelets shall be of the flat flange type, made of anodized aluminum, and shall conform to the dimensional requirements of Table VI. Eyelets shall not be visible on outside of shoe. Testing shall be as specified in 4.3.1.

Table VI - Dimensions of eyelets

| | <u>Minimum</u> inch | <u>Maximum</u> inch |
|---------------------------------|------------------------|------------------------|
| Outside diameter of flange | 0.252 | 0.264 |
| Overall length before setting | 0.135 | 0.150 |
| Diameter of hole before setting | 0.120 | 0.126 |
| Thickness of Aluminum <u>1/</u> | 0.0125 | 0.0155 ¹ |

1/ Thickness before fabrication of eyelet.

3.3.17 Laces, nylon The laces shall conform to Type I, class 1 or Type II, class 1, color black of V-L-61, except that the tips may be of a clear color and heat molded. The length of the laces shall be a minimum of 20 inches and a maximum of 22 inches.

3.3.18 Nails, heel The heel nails shall be brass, steel, cut or wire type, and shall be long enough to securely attach the parts through which they are driven. Nails protruding through the heel tuck shall be clinched over and flattened.

3.3.19 Tacks Tacks shall be brass or steel and shall be long enough to securely attach the parts through which they are driven. Tacks protruding through the insole (permanent holding heel seat area tacks) shall be clinched over and flattened.

3.3.20 Nails, heel seat fastening Nails used for heel seat fastening shall be No. 12 thru 39 head, steel or brass loose nails of sufficient length to assure a smooth, secure clinch. Testing shall be as specified in 4.3.1.

3.3.21 Wax, thread coating The wax used for inseaming and sole stitching operations shall be a permanently plasticized resin that is white or golden in color. The wax, when in the temperature range of normal machine use, shall thoroughly coat the thread when stitching through the sole, welt, and inseam.

3.3.22 Ink, edge finishing The ink used for edge finishing shall be black and suitable for the intended purpose. The ink may be self-setting or may be set on an edge setting machine to a hard semi-bright to bright finish.

3.3.23 Repairers Repairers shall be a liquid spray, crayon or paste type applied by hand. The color shall match the upper leather and shall have sufficient coverage to correct minor surface imperfections of the leather.

3.3.24 Fillers Where fillers are used, they shall be capable of providing a foundation for the application of the top finish.

3.3.25 Top finish The top finish shall be applied by either the sponge or spray method. All finishes applied by the contractor and tanner shall be flexible and compatible with each other to insure a long-lasting high luster finish. The finish shall match the dyed leather and should be capable of being polished to a high luster with a commercial type paste wax.

3.4 Design The shoe shall be a three eyelet, blucher oxford with welt construction. The shoe shall have a box toe, cloth vamp lining, leather quarter lining, synthetic rubber outsole, rubber heel, vamp plug, and scalloped tongue (see figure 1).

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3.5 Patterns A set of upper patterns and markers consisting of component parts indicated in Table VII will be provided as Government furnished property and shall be used by the contractor as a guide when preparing his dies and templates. Minor modifications that will not alter the style lines reflected in Figure 1 shall be permitted to facilitate individual equipment and shoe making operations. Modified patterns are subject to approval by the Contracting Officer. The lasting allowance shall be determined by the contractor to the extent necessary to provide a snug fit of the upper to the last (see 3.6) which will result in a good set to the last after lasting and insure sufficient material for proper lasting allowance. The contractor shall furnish wood insole rounding patterns or dies conforming to the paper patterns furnished by the Government. When required, size 4 component patterns and markers shall be modified to accommodate smaller sizes.

Table VII - Patterns

| Component Parts | Sizes and Widths |
|---|---|
| <u>Patterns:</u> | |
| Vamp, inside | Whole and half sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Vamp outside | Whole and half sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Vamp, doubler, inside (used with calfskin) | Whole and half sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Vamp doubler, outside (used with calfskin) | Whole and half sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Quarter lining | Whole and half sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Vamp lining | Whole sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Quarter lining (counter area) | Whole sizes: 5 widths, AAAAA-AAAA, AAA-AA, A-B, C-D, E-EE |
| Vamp plug and tongue pattern | Whole sizes: 3 widths, AAAAA-AA, A-B, C-EE |
| Vamp plug doubler (used with calfskin) | Whole sizes: 3 widths, AAAAA-AA, A-B, C-EE |
| Tongue lining 1/ | Two sizes and three widths: 4-6½, 7-10 AAAA-AA, A-B, C-EE |
| Box toe | Three sizes: 3-7½, 8-9½, 10-12 |
| Insole Rounding | Whole and half sizes |
| <u>Markers:</u> | |
| Vamp marker, inside | Whole sizes in width AAAAA-EE (ornamental counter stitching not required) |
| Vamp marker, outside | Whole sizes in width AAAAA-EE (ornamental counter stitching not required) |
| Vamp plug and tongue marker | Whole sizes: 3 widths, AAAAA-AA, A-B, C-E |
| 1/ Tongue lining Sizes 7-10 may be used up to size 12 shoes; pattern width AAAAA-AA shall be used on AAAAA width shoes. | |

3.6 Lasts The shoes shall be made on standard US MIL-W-1 women's dress oxford lasts of MIL-L-21635. All necessary sizes will be loaned to the contractor by the Government.

3.7 Construction

3.7.1 Cutting Cut uppers shall be assembled in pairs for color, weight and compatibility of parts.

3.7.2 Skiving The vamp plug shall be skived in the vamp area and scalloped end of tongue. The quarters shall be skived in the vamp area where vamp plug is attached and at the top eyelet row edge. The backseam and toe seam may be skived if necessary. The top edge of the quarter lining and tongue lining shall be skived to reduce bulk. When kip or cattlehide leather is used, the folded edge of the plug may be omitted and the edges of the plug shall be skived and inked.

3.7.3 Marking quarter linings The correct size, width, contractor's name, contract number, and date shall be legibly stamped with black permanent marking ink on the outside quarter lining of each shoe. The lettering shall be 3/16 (+ 1/16) inch high. If additional space is required, the opposite side of the quarter lining may be used.

3.7.4 Upper fitting The upper fitting stitch types, thread sizes, and stitches per inch shall be as specified in Table VIII. Stitch types shall conform to FED-STD-751. Backseams, toe seams, and quarter-lining back seams shall be closed with the stitching close to the edge and rubbed down.

Table VIII - Upper Fitting Requirements

| Operation | Stitch Type | Number of stitches per inch | Thread Size | |
|---|-------------|-----------------------------|-------------|------------------|
| | | | Needle | Bobbin or Looper |
| Toe seam, back seam, quarter lining back seam | 301 or 401 | 11 min. | B or E | B or E |
| Vamp plug and tongue attaching | 301 | 12-14 | B | B |
| Tongue lining | 301 | 12-14 | B | B |
| Lining, quarter and vamp | 301 | 12-14 | 40/4 | 40/4 |
| Lining "V" notch (when used) | 301 or 401 | 12-14 8-10 | 40/4 | 40/4 |
| Top stitching | 301 | 12-14 | B | B |
| Barring | 301 | 12-14 | B | B |

3.7.5 Doubler attachment (used with calfskin) The correct size doublers shall be smoothly and securely cemented to quarters and vamp plug at all points with an adhesive that will not harden the calfskin leather. Doublers are not required when kip or cattlehide leather is used.

3.7.6 Eyelet row reinforcement Reinforce eyelet rows with the stay material specified in 3.3.6.5.

3.7.7 Assembly of quarters and vamp plug Join quarters at backseam with one row of stitching close to the edge and rub down backseam. Fold and cement skived edges of quarters along row of eyelets. Close toe seam with one row of stitching close to edge and rub down seam. Stitch quarter top seam binding to top outside edge of quarter, from top of eyelet row to top of eyelet row, with one row of stitching close to the edge. Turn binding to inside of quarters and cement flesh side. Turn and cement all skived edges of vamp plug (calfskin only) in the vamp and tongue areas. Stitch vamp plug to quarters in vamp area, with two rows of stitching $1/16$ (± 64) inch. Bartack bottom edge of blucher points to vamp plug each bar shall be $3/8$ ($\pm 1/8$) inch long and $1/8$ ($\pm 1/16$) inch wide.

3.7.8 Assembly of quarter lining, vamp lining, tongue lining Overlap and stitch quarter lining pieces (grain side facing inside of shoe) with a double row of stitching $3/32$ ($\pm 1/32$) inch apart. A "V" notch at the bottom of the quarter lining at the back is permitted. Overlap and stitch cloth vamp lining and leather tongue lining to leather quarter lining at both sides of shoe, with a single row of stitching.

3.7.9 Assembly of uppers to linings Stitch top edge of quarter lining to top edge of quarters, from blucher nose to blucher nose, with one row of stitching close to the edge of the binding. The quarter lining leather shall be under-trimmed to minimize exposure. Cement tongue lining to tongue and stitch with one row of stitching all around scalloped edge. Trim off excess tongue lining leather.

3.7.10 Eyeletting On each quarter three eyelets of the type specified in 3.3.16, shall be securely and smoothly clinched between quarter and quarter lining. Eyelets shall be evenly spaced and shall be $1/4$ ($\pm 1/8$) inch from the edge of the quarters to the edge of the eyelet in the finished shoe.

3.7.11 Lacing for lasting Any combination of two pairs of eyelets laced may be used provided there is a $1/2$ ($\pm 1/16$) inch opening after lasting.

3.7.12 Leather insoles When used, leather insoles shall be fleshed and cased for even weight.

3.7.13 Assembly of stuck-on rib insoles When assembled, the stuck-on rib insoles shall meet the requirements of 3.3.6.6.1

3.7.14 Lasting The lasts, insoles, counters, and box toes shall be assembled in accordance with the size and width of the uppers. Uppers may be conditioned by any suitable means except they shall not be dipped in water. The heel tuck shall be coated on one side with any suitable adhesive and joined to the grain side of the insole and properly trimmed. Insoles of the correct size and width shall be tacked to the last with not less than five tacks: one in the center of the heel seat, one at the shank, one at each side of the ball and one at the toe. Edges of the insole shall be flush with the edges of the last bottom at all points. The shoe shall be assembled to the last using tacks only in the heel seat. Correct size counters shall be cemented on both sides from top line to lasting line with any suitable adhesive and inserted between quarter doubler (used with calfskin) and quarter lining. A light coating of any suitable adhesive shall be applied between the quarter doubler (used with calfskin) and vamp lining at the inside shank of each shoe. The correct size box toe shall be conditioned and inserted between the quarter doubler (used with calfskin) and vamp lining. The uppers shall be assembled to the lasts to provide for a wiped-in heel seat approximately 1/2 inch and drawn over the lasts with strong tension on the pulling-over machine to assure that quarters at the blucher points and vamp are down over the last and blucher noses are even. The sides of the shoes shall be spindled, drawing the uppers snugly to the last, and then side-lasting so that when stapled, the upper will be held securely to the last. The vamp lining shall be pulled smooth and tight without any tears. The heel seat shall be wiped-in flat and free from wrinkles. The toe shall be smoothly wiped-in and securely attached around the base of the insole rib. Any suitable method or automatic equipment that assures a flat secure heel seat and sufficient adhesion between the counter material, quarters, and counter pocket may be used. Backpart lasting shall conform to the last and there shall be no wrinkles, pleats, puckers or fullness.

3.7.15 Time allowance on lasts The shoes shall remain on the lasts until thoroughly dry.

3.7.16 Inseaming Inseaming shall be done by machine with a polyester thread using a needle not larger than No. 41 with not less than 3 1/4 stitches per inch. The welting shall be tempered to provide a tight seam without cracking. The welting shall be inseam stitched to the bottom of the insole rib, from rib end to rib end, and shall catch in the counter with one or more stitches on each end.

3.7.17 Tack pulling, inseam trimming All tacks shall be removed and no broken tack points shall remain. The inseam shall be closely trimmed from butt of welt to butt of welt without cutting or damaging the stitches. The ends of the welt shall be skived with a 3/8 (+ 1/8, - 1/16) inch bevel and tacked within the butt area. The welt shall be beaten out smoothly while in temper to lie flat around the entire forepart of the shoe.

3.7.18 Shank fitting and bottom filling

3.7.18.1 Steel shanks The properly sized steel shank shall be inserted in position from the ball line rearward to the back of the heel seat. The forward end of the shank shall be flush with the insole and shall fit the contour of the shoe bottom back of the ball line. The shank shall be attached to the shoe with pitch-wax, two tacks or staples, one on each side of the steel piece at the rear end. The bottom filler shall be firmly pressed into the insole cavity around the toe, extending to the forward end of the shank with a uniform and even surface. Any excess cavities in the shank and heel seat area shall be filled with bottom filler.

*3.7.18.2 Fiberglass shanks When the alternate fiberglass shank specified in 3.3.10.2 is used, the toe end of the shank shall be positioned approximately 1/2 inch rearward of the ball line with the heel end of shank extending into the heel seat area. The shank shall be cut, positioned, shaped, bonded, and cured during the same operation using automatic shank setting equipment. Bottom filler shall be applied starting at the toe end of the shank and working back through the heel seat area filling all cavities around the shank.

3.7.19 Sole laying The shoe bottoms, cemented all over with a suitable adhesive, and the soles shall be laid on a sole laying machine with pressure to hold the sole to the welt at all points. The soles shall be laid evenly and shall be large enough to obtain the finished edge extension specified in 3.7.26.

3.7.20 Rough rounding The soles shall be smoothly rounded on a rough rounding machine to provide for the finished edge extension specified in 3.7.26.

3.7.21 Sole stitching The soles and welts shall be stitched together on a lockstitch machine using thread specified in 3.3.15.2.1 or 3.3.15.2.2. The needle and awl shall be not larger than No. 47 and there shall be 5 1/2 to 7 1/2 stitches per inch. The stitching shall be laid on the surface of the welt, close to the outer edge of the welt on the finished shoe. The stitching shall be adjusted so that the lock is just under the surface of the outsole.

3.7.22 Heel seat fastening The heel seat fastening shall be done by a fastening machine using nails specified in 3.3.20. When fastening is accomplished using automatic (gang fastener) equipment, the pattern provided by the equipment will be acceptable. When steel or brass nails are used they shall be spaced not less than three to the inch and shall clinch properly on the insole. Nails shall be positioned at the edge of the insole and extend around the heel seat from butt of welt to butt of welt.

3.7.23 Heel seat rounding The heel seat of the outsoles shall be smoothly rounded from butt of welt to butt of welt.

3.7.24 Heeling The rubber heel and heel base may be cemented together with any suitable adhesive. The assembled heel and heel base shall be attached with seven nails with the center breast nail omitted. The nails shall be long enough to insure a secure, smooth clinch on the heel tuck and insole. The heeling machine shall be equipped with proper length drivers to drive the nails evenly against the metal washers in the heels.

3.7.25 Heel trimming, finishing The edges of the heel shall be shaved square and then scoured to a smooth finish free of indentations and ridges. The heel breast shall be scoured. The finished heel height, including outsoles, shall measure 1 ($\pm 1/32$) inch at all points.

3.7.26 Edge trimming The edges shall be trimmed square. The finished edge extension shall be $1/8$ ($\pm 1/32$) inch at the outside ball, around the toe to the inside ball. The edges of the sole and welt shall be smoothly jointed.

3.7.27 Edge finishing The edges of welting, soles, and heels shall be finished with the ink specified in 3.3.22.

3.7.28 Bottom finishing The bottoms shall be clean and smooth.

3.7.29 Finish

3.7.29.1 Preparation The shoes shall be cleaned, removing any accumulated dirt, wax, cements, or other foreign matter. All thread ends shall be trimmed.

3.7.29.2 Treeing All wrinkles shall be removed from the shoes while on the last. No method or material shall be used that may injure the leather or thread.

3.7.29.3 Final finish The shoes shall be repaired and filled, whenever necessary, and given a final top finish. The shoes may be cloth brushed to achieve a bright luster. Any exposed raw edges shall be stained to match the upper leather.

3.7.29.4 Edge pad and brush The edges of the welt, sole and heel shall be padded and brushed to a bright finish.

3.7.30 Nails and tacks Nails and tacks that have been left protruding through the insole and cannot be pulled out, shall be cut flush with the surface leaving no protruding stumps. A mechanical tack detector or other suitable automatic tack detecting equipment may be used to indicate the presence of any protruding nails or tacks inside the shoe.

3.7.31 Heel pad, felt and heel pad, leather The felt heel pad shall be coated with any suitable adhesive on one side only and firmly pressed onto the heel seat. The leather heel pad shall be coated with any suitable adhesive on the flesh side only and pressed firmly onto the heel seat.

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3.7.32 Lacing-mating The shoes shall be mated and a lace shall be inserted through the lower eyelet of each shoe and tied in a loose knot.

3.8 Workmanship The finished shoes shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Certificate of compliance Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 First article inspection When required, the first article submitted in accordance with 3.2, shall be inspected as specified in 4.3.4 for compliance with design, construction, workmanship and dimensional requirements.

4.3 Inspection Sampling for inspection shall be in accordance with MIL-STD-105, except where otherwise indicated herein.

4.3.1 Component and material inspection In accordance with 4.1, components and materials shall be tested in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document. In addition, testing shall be performed on components and materials listed in Table IX for the characteristics shown. The results shall be applicable to the individual sample unit or to the lot average as indicated, or as required by the referenced test method. All test reports shall contain the individual values utilized in expressing the final results. The lot shall be unacceptable if one or more sample units, the lot average or the composite sample fail to meet any requirement specified. The sample size shall be as follows:

| <u>Lot Size</u> | <u>Sample Size</u> |
|-----------------|--------------------|
| 800 or less | 2 |
| 801 thru 22,000 | 3 |
| 22,001 and over | 5 |

4.3.1.1 Examination of components

*4.3.1.1.1 Examination of insoles

- (a) Leather insoles - When used, the leather insoles shall be examined for visual and dimensional requirements conforming to the provisions of the end item examination outlined in KK-I-570.
- (b) Synthetic insoles (TRXORIST) - When used, the synthetic insoles shall be examined for the defects listed below. The inspection level shall be level II and the acceptable quality level (AQL) shall be 4.0 defects per 100 units.

Any hole, cut, tear or gouge.

Any brittle area or evidence of delamination.

Thickness not as specified.

Sole outline not conforming to required pattern.

Sole not cut in specified direction.

4.3.1.1.2 Examination of counters The counters shall be examined for visual and dimensional requirements conforming to the provisions of the end item examination of MIL-C-41814.

4.3.1.1.3 Examination of uppers prior to fitting A 100 percent examination of each cut quarter and vamp plug for defects listed below shall be conducted prior to fitting. Any cut quarter or vamp plug containing one or more of the following defects shall result in rejection of that cut part:

- a. Scratch or scar
- b. Slaughter cut
- c. Flesh cut penetrating through the grain surface
- d. Damaged grain surface, cracked
- e. Brand
- f. Belly cuts
- g. Flanky, pipey, loose or any rough or coarse grain 1/
- h. Cluster of veins, split veins or pronounced veins

1/ These defects may appear in the counter area of the quarter back of the breast of the heel or in the tongue area.

4.3.2 In-process inspection Inspection shall be made at any point or during any phase of the manufacturing process to determine whether operations or assemblies are accomplished as specified. The Government reserves the right to exclude from consideration for acceptance any material or service for which in-process inspection has indicated non-conformance.

TABLE IX - TESTING OF COMPONENTS

| Component and unit of product | Characteristic | Specification reference | | Requirement applicable to | | No. of determinations per sample unit | Results reported as | Sample unit |
|-------------------------------|------------------|-------------------------|-------------|---------------------------|-------------|---------------------------------------|---------------------|-----------------------|
| | | Requirement paragraph | Test method | Sample unit | Lot average | | | |
| Upper leather | Mat'l ident. | 3.3.1 | 2/ | | | | | |
| | Color | 3.3.1 | Visual | X | | 1 | Pass or Fail | one 8x8 inch piece 1/ |
| | Chrome tannage | 3.3.1 | 2/ | | | | | |
| | Grain | 3.3.1 | Visual | X | | 1 | Pass or Fail | |
| Area of side | 3.3.1 | 2/ | | | | | | |
| | Paranitrophenol | 3.3.2.1 | 6711 3/2/ | | | | | |
| Lining | Mat'l ident. | 3.3.2 | 2/ | | | | | |
| | Color | 3.3.2 | Visual | X | | 1 | Pass or Fail | one 2x2 piece 1/ |
| | Finish | 3.3.2 | Visual | X | | 1 | Pass or Fail | |
| | Grain | 3.3.2 | Visual | X | | 1 | Pass or Fail | |
| | Paranitrophenol | 3.3.2.1 | 6711 3/ 2/ | | | | | |
| * Insoles (TEXORIST) | Mat'l ident. | 3.3.4 | 2/ | | | | | |
| | Copper 8-Quin | 3.3.4 | 2/ | | | | | |
| | Thickness | 3.3.4 | 2/ | | | | | |
| * Welting Synthetic | Hardness | 3.3.5.2 | D2240 5/ 2/ | | | | | |
| | Specific Gravity | 3.3.5.2 | D792 5/ 2/ | | | | | |
| | Brittle point | 3.3.5.2 | D746 5/ 2/ | | | | | |
| | Tensile strength | 3.3.5.2 | D412 5/ 2/ | | | | | |
| | Elongation | 3.3.5.2 | D412 5/ 2/ | | | | | |
| Vamp lining | Mat'l Ident. | 3.3.6.1 | 2/ | | | | | |
| | Weave | 3.3.6.1 | Visual | | X | 1 | Pass or Fail | One yard full width |
| | Color | 3.3.6.1 | Visual | X | | 1 | Pass or Fail | |

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TABLE IX - TESTING OF COMPONENTS (cont'd)

| Component and unit of product | Characteristic | Specification reference | | Requirement applicable to | | No. of determinations per sample unit | Results reported as | Sample unit |
|-----------------------------------|----------------|-------------------------|---------------------------|---------------------------|-------------|---------------------------------------|---------------------|---------------------|
| | | Requirement paragraph | Test method | Sample unit | Lot average | | | |
| Vamp lining (cont'd) | Weight | 3.3.6.1 | 5041 $\frac{4}{\text{ }}$ | X | | | | |
| | Yarns per inch | 3.3.6.1 | 5050 $\frac{4}{\text{ }}$ | X | | | | |
| | Breaking str. | 3.3.6.1 | 5100 $\frac{4}{\text{ }}$ | X | | | | |
| | Non-fibrous | 3.3.6.1 | 2611 $\frac{4}{\text{ }}$ | X | | | | |
| Doublers | Mat'l Ident. | 3.3.6.2 | 2/ | X | | | | One yard full width |
| | Non-fibrous | 3.3.6.2 | 2611 $\frac{4}{\text{ }}$ | X | | | | |
| | Yarns per inch | 3.3.6.2 | 5050 $\frac{4}{\text{ }}$ | X | | | | |
| | Breaking str. | 3.3.6.2 | 5100 $\frac{4}{\text{ }}$ | X | | | | |
| | Weight | 3.3.6.2 | 5041 $\frac{4}{\text{ }}$ | X | | | | |
| | Color | 3.3.6.2 | Visual | X | | 1 | Pass or Fail | |
| Quarter-top Binding (French Cord) | Mat'l Ident. | 3.3.6.3 | 2/ | | | | | One yard full width |
| | Width | 3.3.6.3 | 5020 $\frac{4}{\text{ }}$ | X | | | | |
| | Color | 3.3.6.3 | Visual | | X | | Pass or Fail | |
| | Weight | 3.3.6.3 | 5041 $\frac{4}{\text{ }}$ | X | | | | |
| Felt | Colorfastness | 3.3.6.3 | 5651 $\frac{4}{\text{ }}$ | X | | | | |
| | | | | | | | | |
| Eyelet stay | Mat'l Ident. | 3.3.6.4 | 2/ | | | | | |
| | Weight | 3.3.6.4 | 2/ | | | | | |
| | Color | 3.3.6.4 | 2/ | | | | | |
| Eyelet stay | Mat'l Ident. | 3.3.6.5 | 2/ | | | | | |
| | Width | 3.3.6.5 | 2/ | | | | | |
| Insole rib-fabric | Mat'l Ident. | 3.3.6.6 | 2/ | | | | | |
| | Yarns per inch | 3.3.6.6 | 2/ | | | | | |
| | Breaking str. | 3.3.6.6 | 2/ | | | | | |
| | Color | 3.3.6.6 | 2/ | | | | | |
| | Weight | 3.3.6.6 | 2/ | | | | | |
| | | | | | | | | |

TABLE IX - TESTING OF COMPONENTS

(cont'd)

| Component and unit of product | Characteristic | Specification reference | | Requirement applicable to | | No. of determinations per sample unit | Results reported as | Sample unit |
|-------------------------------|---|---|--|---------------------------|-------------|---------------------------------------|---------------------|-------------|
| | | Requirement paragraph | Test method | Sample unit | Lot average | | | |
| * Counter synthetic | Specific gravity Tensile str. Elongation Flex modulus Brittle point | 3.3.7.2 3.3.7.2 3.3.7.2 3.3.7.2 3.3.7.2 | D792 5/ 2/ D1708 5/ 2/ D1708 5/ 2/ D790 5/ 2/ D746 5/ 2/ | | | | | |
| Box toe | Mat'l Ident. Thickness | 3.3.8 3.3.8 | 2/ 2/ | | | | | |
| Bottom filler | Type | 3.3.9.1 | 2/ | | | | | |
| Thermoplastic | Cork/binder mix Softening point of binder Penetration binder | 3.3.9.1 3.3.9.1 3.3.9.1 | 2/ 2/ 2/ | | | | | |
| Bottom filler | Type | 3.3.9.2 | 2/ | | | | | |
| Cold process | Cork/binder mix. Softening point of binder | 3.3.9.2 3.3.9.2 | 2/ 2/ | | | | | |
| Steel shank | Mat'l Ident. Thickness Width Hardness | 3.3.10.1 3.3.10.1 3.3.10.1 3.3.10.1 | 2/ 2/ 2/ 2/ | | | | | |
| * Fiberglass shank | Mat'l Ident. Width Heat curable | 3.3.10.2 3.3.10.2 3.3.10.2 | 2/ 2/ 2/ | | | | | |

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TABLE IX - TESTING OF COMPONENTS (cont'd)

| Component and unit of product | Characteristic | Specification reference | | Requirement applicable to | | No. of determinations per sample unit | Results reported as | Sample unit |
|--|--|--|----------------------------|---------------------------|-------------|---------------------------------------|---------------------|-------------|
| | | Requirement paragraph | Test method | Sample unit | Lot average | | | |
| Adhesives | Mat'l Ident. | 3.3.11 | 2/ | | | | | |
| Heel tuck | Mat'l Ident. Thickness | 3.3.12 3.3.12 | 2/ 2/ | | | | | |
| Heel base plastic | Mat'l Ident. Hardness Canter design Spec Gravity Filler | 3.3.13 3.3.13 3.3.13 3.3.13 3.3.13 | 2/ 2/ 2/ 2/ 2/ | | | | | |
| Eyelets | Mat'l Ident. Finish Dimensions | 3.3.16 3.3.16 3.3.16 | 2/ 2/ 2/ | | | | | |
| Nails | Mat'l Ident. Head size | 3.3.20 3.3.20 | 2/ 2/ | | | | | |
| 1/ The sample size shall consist of 15 pieces selected from 15 sides or skins. Refer to Section 4 of FED-STD-311 for inspection sampling procedures. 2/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the requirement stated. 3/ Refers to FED-STD-311. 4/ Refers to FED-STD-191. 5/ Refers to ASTM Standards. | | | | | | | | |

4.3.3 Intermediate inspection

4.3.3.1 Visual examination The defects found during the intermediate examination shall be classified in accordance with 4.3.3.1.1 and 4.3.3.1.2. The applicable inspection levels and acceptable quality levels shall be as indicated in 4.3.3.1.3.

NOTE: Defects designated by an asterisk (*) shall be scored as major when seriously affecting serviceability and minor when affecting serviceability, but not seriously.

4.3.3.1.1 Examination of uppers after all fittings The upper assembly shall be examined for defects in cutting, fitting, and other construction characteristics which cannot be seen in the finished end item. The sample unit shall be one completely fabricated upper assembly prepared for lasting. The lot shall be expressed in units of one upper.

| Examine | Defect | Classification | |
|---------------------------------------|--|----------------|-------|
| | | Major (*) | Minor |
| Construction and workmanship | a. Any component missing or not specified type | X | |
| | b. Quarter and vamp doublers not cemented to leather (when calfskin is used) | | X |
| | c. Any component misplaced, damaged or not affixed as specified | * | |
| | d. Construction not as specified | * | |
| | e. Backseam and toeseam not rubbed down | | X |
| Quality of leather (upper and lining) | a. Thickness less than minimum specified | X | |
| | b. Thickness up to 1/2 ounce more than maximum specified | | X |

4.3.3.1.2 Examination of shoe before bottom filling The partially fabricated shoe shall be examined for defects in construction and workmanship characteristics which cannot be seen in the finished end item. The sample unit shall be one partially constructed shoe at a point after lasting and attachment of shank but before the application of bottom filler. The lot size shall be expressed in units of one shoe.

| Examine | Defect | Classification | |
|-----------------|--|----------------|-------|
| | | Major (*) | Minor |
| Bottom of shoes | a. Any component missing or not specified type | X | |
| | b. Shank not properly positioned or not fitting contour of shoe bottom | * | |
| | c. Shank wrong size or malformed | * | |

| Examine | Defect | Classification | | |
|-----------------------------|---|----------------|-----|-------|
| | | Major | (*) | Minor |
| Bottom of shoes (cont'd) | d. Shank not securely attached | | * | |
| | e. Any tear in cotton duck in stitch area: | | | |
| | 1. more than 3/4 inch | X | | |
| | 2. more than 1/2 but not more than 3/4 inch | | | X |
| | f. Insole tack, staple or anchor tack not removed | X | | |
| | g. Excess leather in heel seat interfering with proper fit of shank | X | | |
| | h. Poor adhesion between counter material and upper | | * | |
| | i. Upper damaged in lasting | | * | |
| | j. Poor heel seat, side or toe lasting (including automatic method) | | * | |
| | k. Inseam not properly trimmed | | * | |
| | l. Less than 3 stitches per inch on inseam | X | | |
| | m. Two or more stitches broken, two or more consecutive skipped inseam stitches or inseam stitches cut or damaged during trimming operation | | * | |
| | n. Broken insole rib | | * | |
| | o. Inseam stitching not at bottom of insole rib, i.e., 1/16 inch from bottom of rib for 6 or more stitches | | | X |
| | p. Inseam stitching not at bottom of insole rib, i.e., 1/8 inch from bottom of rib for more than 4 stitches | X | | |
| | q. Inseam stitching not in welt groove | X | | |
| | r. Ends of counter not caught in inseam stitching | X | | |
| | s. Welt not properly beaten out, i.e., not flat | | | X |
| | t. Welt butts not skived | X | | |
| | u. Welt butts not tacked within skived area | | | X |
| Upper part of shoes | a. Uppers not tightly pulled down to last | | | X |
| | b. Lace opening less than 7/16 inch or more than 9/16 inch | X | | |
| | c. Two pair of eyelets not laced | X | | |

4.3.3.1.3 Intermediate inspection levels The inspection levels and acceptable quality levels (AQL's) expressed in defects per 100 units shall be as follows:

| | <u>Inspection level</u> | <u>AQL</u> | |
|--------------------------------|-------------------------|------------|-------|
| | | Major | Total |
| For 4.3.3.1.1 (Upper fittings) | I | 2.5 | 6.5 |
| For 4.3.3.1.2 (Bottoms) | I | 2.5 | 6.5 |

4.3.3.2 Testing of the combined stuck-on rib and insole The stuck-on rib shall be tested for compliance with the requirements of 3.3.6.6.1. Method 2061 of FED-STD-311 shall be used for shear strength test, and Method 2171 of FED-STD-311 shall be used for stitch tear strength. The sample unit shall be two ribbed insoles, one for each test, and the sample size shall be 5, regardless of the lot quantity. Requirements are applicable to the sample unit for individual unit requirements and lot average for average requirements. The lot shall be unacceptable if one or more sample units or the lot average of all units fail to meet the requirement specified. All test reports shall contain the individual values utilized in expressing the final results.

4.3.4 Inspection of the finished end item The defects found during examination shall be classified in accordance with 4.3.4.1. The inspection and AQL levels shall be as indicated in 4.3.4.2.

4.3.4.1 Visual examination The finished shoes shall be examined for defects in pairing, design, material, construction, workmanship, finish, and marking. The sample unit shall be one completely fabricated shoe and the selection shall be by pairs. The lot size shall be expressed in units of one shoe. Defects of pairing shall be classified as a single defect. Heel pads removed by the Government during verification examination shall be recemented and replaced by the contractor's personnel. The vamp plug (except tongue area) and quarter area shall be examined for break in leather in accordance with the procedure below.

Vamp plug To examine the vamp plug, the shoes shall be held in an upright position with both hands. The toe of the shoe shall face away from the examiner. Position thumbs on top of vamp approximately half way between box toe line and blucher noses and 1 to 1 1/2 inches apart. Press downward with the thumbs so as to form grain surface into a concave surface. The break in leather between the thumbs and running across the plug shall be observed and compared with the break patterns of the Satra scale (see 6.4). Any vamp plug exhibiting a break pattern greater than No. 3 (calfskin) or No. 4 (kip or cattlehide leather) on the Satra scale shall be scored as a defect.

Quarter area: Bend the shoe in the quarter area in a concave position. The break in leather shall be compared with the break pattern of the Satra scale (see 6.4). Any quarter area exhibiting a break pattern greater than No. 3 (calfskin) or No. 4 (kip or cattlehide leather) on the Satra scale shall be scored as a defect. (NOTE: Regarding conditions affecting appearance, defects shall be scored only when the condition is plainly visible at a distance of 3 or more feet. Defects designated by an asterisk (*) shall be scored as major when seriously affecting serviceability or appearance and minor when affecting serviceability or appearance but not seriously.)

| <u>Examine</u> | <u>Defect</u> | <u>Classification</u> | | |
|------------------------------------|--|-----------------------|-----|-------|
| | | Major | (*) | Minor |
| <u>Pairing</u> | a. Not properly mated, i.e., not right and left of same size, variation in color or appearance | X | | |
| | b. Box toe crooked, long or short | | * | |
| <u>Cleanliness</u> | a. Any non-removable spot, stain or foreign matter affecting appearance | | | X |
| <u>Color and finish</u> | a. Not color specified | X | | |
| | b. Color not uniform, affecting appearance | | | X |
| | c. Upper leather not finished to provide a luster | | | X |
| | d. Finish streaky, runs, chipped or flaky on upper 2/ | | | X |
| | e. Any raw edges not stained to match upper leather | | | X |
| <u>Design, type and size</u> | a. Not as specified | X | | |
| <u>Leather, upper</u> (Quality) | a. Scratches, slaughter cuts, cuts on grain surface, brands or light flesh cuts that show through on grain surface and/or | | | |
| | b. Fat wrinkles, pits, insect damage in vamp plug or in quarters in front of the breast of the heel and/or | | | |
| | c. Flanky, pipey, loose, cracked, rough or coarse grain surface in the vamp plug or quarters in front of the breast of heel (See NOTE:) and/or | | | |
| | d. Any other defect in the front part of shoe shall be classified as follows: | | | |
| | 1. Seriously affecting appearance when viewed at a distance of three feet or more. | X | | |

| Examine | Defect | Classification | |
|---|--|----------------|-----------|
| | | Major | (*) Minor |
| Leather, upper (Quality) (cont'd) | 2. Affecting appearance but not seriously when viewed at a distance of three feet or more | | X |
| | e. Break of vamp plug and quarter areas not as specified in 3.3.1 | X | |
| | f. Not full or corrected grain | X | |
| | NOTE: These defects may appear in the counter area of the quarters in back of the breast of the heel or in the tongue area. | | |
| | | | |
| | | | |
| <u>Lining leather</u> (Quarter, tongue and heel pad) | a. Grain not smooth or uniform, seriously affecting serviceability | X | |
| | b. Slaughter cuts, serious affecting serviceability | X | |
| | c. Pipey or flanky | X | |
| | | | |
| <u>Construction and workmanship</u> | a. Any cut, tear, hole or abrasion | | * |
| | b. Any component or assembly omitted or misplaced | | * |
| | c. Operation omitted or not properly performed | | * |
| | | | |
| <u>Seams and stitching of upper</u> | a. Open seam | | * |
| | NOTE: A seam shall be classified as open when one or more stitches joining a seam are broken or when two or more continuous skipped stitches or runoffs occur. On multiple stitched seams, a seam is considered open when either one or both sides of the seam are open. | | |
| | | | |
| | b. Tight tension resulting in puckering or cutting of leather | | * |
| | c. Loose tension resulting in a loosely secured seam | | * |
| | d. Wrong seam or stitch type | | * |
| | e. Any row of stitching with 2 or more stitches per inch less than minimum specified | X | |
| | f. Any row of stitching with one stitch per inch less than minimum specified | | X |
| | | | |
| | | | |

| <u>Examine</u> | <u>Defect</u> | <u>Classification</u> | | |
|--|--|-----------------------|-----|-------|
| | | Major | (*) | Minor |
| <u>Seams and stitching of upper (cont'd)</u> | g. Any row of stitching with more than the maximum number of stitches per inch specified | | * | |
| | h. Any barring missing | X | | |
| | NOTE: A plus tolerance of three stitches per inch will be allowed when stitching over heavy places or turning sharp corners. | | | |
| | i. Gage or spacing of stitching not as specified or irregular | | * | |
| | j. Top stitching not passing through quarter lining | X | | |
| | k. Stitching omitted when required | | * | |
| | l. Thread ends not trimmed throughout shoe | | | X |
| | m. Needle holes or needle chew | | * | |
| | n. Stitching overrun resulting in stitching where not intended | | | X |
| | | | | |
| <u>Outsole</u> | a. Less than 5 1/2 stitches per inch | X | | |
| | b. More than 7 stitches per inch | | | X |
| | c. Outsole stitching not as specified or irregular | | * | |
| | d. Broken stitch, one or more | | * | |
| | e. Skipped stitches, two or more consecutive | | * | |
| | f. Stitches short at heel breast | | * | |
| <u>Counter</u> | a. Rolled or curled counter | | * | |
| | b. Soft counter | | | X |
| <u>Edge making</u> | a. Edge trimmed into sole stitching | | * | |
| | b. Edge not trimmed square or trimming is irregular affecting appearance | | | X |
| | c. Sole extension less than specified minimum | | * | |
| | d. Sole extension more than maximum specified | | | X |
| | e. Edge not set | X | | |
| | f. Joining of sole and heel trimming not smooth, e.g., ridges, undercuts | | * | |
| <u>Heel finishing and attaching</u> | a. Heel not properly trimmed, i.e., is pronouncedly flared or tapered | | * | |
| | b. Heel not finished smooth, including heel breast | | * | |

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| Examine | Defect | Classification | |
|--|--|----------------|-------|
| | | Major (*) | Minor |
| <u>Heel finishing and attaching (cont'd)</u> | c. Open heel seat | * | |
| | d. Checked heel, i.e., separation between heel and heel base or between heel base and outer sole | | X |
| | e. Crooked or wrong size heel | | X |
| | f. Any heel nail other than center breast, corner breast, or center back nail missing | | X |
| | g. Center back or corner breast nail missing or not clinched on heel tuck | X | |
| | h. More than one heel nail, other than center back or corner breast nail, not clinched on heel tuck | | X |
| | NOTE: Evidence of heel nail on the insole or tuck shall indicate clinching. | | |
| | | | |
| <u>Eyelets</u> | a. Number of eyelets not as specified but each row has the same number | | X |
| | b. Not the same number of eyelets in each row | X | |
| | c. Eyelets not properly spaced within the rows of misalignment between the row to an extent interfering with proper lacing | * | |
| | d. Edge of any eyelet less than 1/8 inch or more than 3/8 inch from the edge of quarter | * | |
| | e. Any eyelet not securely clinched | | X |
| <u>Inseaming</u> | a. Grinning seam, i.e., thread exposed | X | |
| | b. Strained seam, i.e., needle holes visible but thread not exposed | | X |
| <u>Insole</u> | a. Short or long | * | |
| | b. Any protruding point of tack or nail on insole forward of heel breast line (See footnote 1/ and 4.3.4.2) | | |
| | c. Any protruding point of tack, or nail in heel seat area | X | |
| | d. More than two heel seat nails runoff insole | X | |

| <u>Examine</u> | <u>Defect</u> | <u>Classification</u> | |
|------------------------|---|-----------------------|-------|
| | | Major (*) | Minor |
| <u>Insole</u> (cont'd) | e. More than three heel seat nails runoff insole | | X |
| | f. No evidence of heel seat fastening. | | X |
| | g. Heel pad not securely cemented at all points | | X |
| <u>Lining</u> | a. Quarter or vamp lining wrinkled, loose, or with excessive fullness | | X |
| | b. Quarter or vamp lining torn | X | |
| | c. Tongue lining wrinkled or torn | | X |
| <u>Marking</u> | a. Missing, incomplete, incorrect, not applied in the specified manner, misplaced, illegible, or not specified size | | X |

1/ Any protruding point of tack or nail forward of the breast line, found in the sample shall cause rejection of the lot represented.

2/ Examination for flaky or chipped finish shall be conducted during examination for break in leather.

4.3.4.2 Finished end item inspection levels The inspection level and the acceptable quality levels (AQL) expressed in defects per 100 units shall be as follows:

| | <u>Inspection level</u> | <u>Major</u> | <u>AQL</u> <u>Total</u> |
|-----------------------------|-------------------------|--------------|----------------------------|
| For 4.3.4.1 (Finished Shoe) | II | 2.5 | 6.5 |

NOTE: The above AQL's do not apply to protruding point of nail or tack found forward of heel breast line in insole.

4.3.5 Examination of packaging requirements An examination shall be made to determine that the packaging, packing and marking comply with the Section 5 requirements. Defects shall be scored in accordance with the list below. The sample unit shall be one shipping container fully packaged with the exception that it need not be closed. Defects of closure listed below shall be examined on shipping containers fully packaged for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 and the AQL shall be 2.5 defects per hundred units.

| <u>Examine</u> | <u>Defect</u> |
|---------------------------------|--|
| Marking (exterior and interior) | Omitted, incorrect, illegible, of improper size, location, sequence, or method of application. |

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Materials

Any component missing or not as specified.
Any component damaged, affecting serviceability.

Workmanship

Inadequate application of components, such as: improper taping, incomplete closure of container flaps, loose strapping or inadequate stapling. Bulged or distorted container.

Content

Number of interior packages per shipping container is more or less than required. Size indicated on shoes not the same as specified on packages or shipping container. 1/

1/ For this defect, one package from each container in the packaging inspection lot shall be examined.

5. PACKAGING

5.1 Preservation-packaging Packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A Each shoe shall be wrapped in a sheet of bleached or unbleached regular commercial grade tissue paper cut approximately 18 by 24 inches in size. As an alternate, each shoe shall be inserted into a snug-fitting clear polyethylene film bag of 0.00125 inch thickness (+ 25 percent tolerance). The open end of the bag shall extend a minimum of 2 inches beyond the length of the shoe. Each mated pair of shoes shall then be packaged in a two piece partial telescope style shoe box.

5.1.1.1 Shoe boxes Fabricated from nonbending grades of boxboard and formed with cut scores and set in ends, shall be not less than 0.040 inch thickness and shall conform to type IX, variety 1, class A or D, style 4 of PPP-B-676. The outside portion of each shoe box shall be completely covered with a 40 pound minimum basis weight commercial grade kraft paper in accordance with PPP-B-676.

5.1.1.2 Shoe boxes Fabricated from bending grades of boxboard and formed by creasing, shall be not less than 0.032 inch thickness and shall conform to variety 1, style III, type G, Class j, subclass 2, group I of PPP-B-566.

5.1.1.3 Shoe box dimensions The outside dimensions of the shoe box (cover included) shall be as follows:

| Range of Shoe Sizes | <u>Length</u> Inches | <u>Width</u> Inches | <u>Depth</u> Inches | <u>Lid Depth</u> Inches |
|-----------------------|-------------------------|------------------------|------------------------|----------------------------|
| 3 to 8 1/2 all widths | 11 1/2 | 5 3/4 | 4 1/2 | 1 |
| 9 to 12 all width | 12 1/4 | 5 3/4 | 4 1/2 | 1 |

5.1.2 Level C (Commercial packaging) Shoes shall be packaged to afford adequate protection against physical damage during shipment from the contractor to the first receiving activity. The package and the quantity per package shall be the same as that normally used by the contractor for retail distribution.

5.2 Packing Packing shall be level A, B or C as specified (see 6.2).

* **5.2.1 Level A** Twelve pairs of shoes of one size and width only, packaged as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC, type CF, class weather-resistant, grade VI5c, variety DW of PPP-B-636. Level A packages shall be packed on end, four in length, three in width, and one in depth within a shipping container. Inside dimensions of each shipping container shall approximate 23 1/2 inches in length, 14 inches in width and 12 1/2 inches in depth. Approximate dimensions are furnished as a guide only. Voids within the shipping container shall be filled with folded or scored corrugated fiberboard pads to immobilize the contents. Each shipping container shall be closed in accordance with method III, taped in accordance with method V, and reinforced as specified in the appendix of PPP-B-636. Toward the end of the contract or when there are less than the required number of shoes per container of the same size and width, mixed sizes and widths may be packed within the same container.

* **5.2.2 Level B** Twelve pairs of shoes of one size and width only, packaged as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC, type CF, class domestic, variety DW, grade 275 of PPP-B-636. Level A packages shall be packed on end, four in length, three in width and one in depth within the shipping container. Inside dimensions of each shipping container shall approximate 23 1/2 inches in length, 14 inches in width and 12 1/2 inches in depth. Approximate dimensions are furnished as a guide only. Voids within the shipping container shall be filled with folded or scored corrugated fiberboard pads to immobilize the contents. Each shipping container shall be closed in accordance with method II as specified in appendix of PPP-B-636. Toward the end of the contract or when there are less than the required number of shoes per container of the same size and width, mixed sizes and widths may be packed within the same container.

5.2.3 Level C (Commercial packing) Shoes, packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. The quantity per shipping container shall be the same as that normally used by the contractor for retail distribution. Containers shall comply with the US POSTAL SERVICE MANUAL, Uniform Freight Classification Rules or National Motor Freight Classification Rules, as applicable.

5.3 Marking In addition to any special marking required by the contract, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

5.3.1 Labels, mixed sizes Each shipping container packed with mixed sizes shall have securely attached to the end and side, directly under the printing or stenciling, a white paper label 5 by 4 inches with the words "MIXED SIZES" plainly printed or stamped thereon and under these words shall be legibly printed or stamped the correct quantity of pairs and sizes container therein.

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6. NOTES

6.1 Intended use The shoes are intended for wear by female personnel of the Department of Defense.

6.2 Ordering data Procurement documents should specify the following:

- a. Title; number and date of this specification.
- b. Sizes and widths required (see 1.2).
- c. Whether first article is required (see 3.2).
- d. Availability of patterns and lasts (see 3.5 and 3.6).
- e. Selection of applicable levels of packaging and packing (see 5.1 and 5.2).

6.3 Samples For access to samples, address the procuring activity issuing the invitation for bids.

6.4 The Satra scale may be obtained from the British Shoe and Allied Trade Research Association, Satra House, Kettering, Northants, England or may be obtained from Bata Engineering, Battawa, Ontario, Canada.

***6.5 Suppliers of component parts** To obtain a list of approved component part suppliers write to: Navy Clothing and Textile Research Facility, 21 Strathmore Road, Natick, MA 01760. The list is available only to indicate possible sources of supply. Any unlisted supplier with a similar item that is equal to or better than the approved item will also be acceptable.

***6.6 Fiberglass shank** A fiberglass shank manufactured by American Shoe Machinery Co., 30 Nashua Street, Woburn, MA 01801 under their designation "TRU-FIT", has been found to meet the requirements of 3.3.10.2.

6.7 Changes from previous issue The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - GL
Navy - NU
Air Force - 99

Preparing activity:

Navy - NU

Review activities:

Army - MD
Air Force - 11, 82

Project No. 8435-0053

User Activities:

Navy - CG, MC

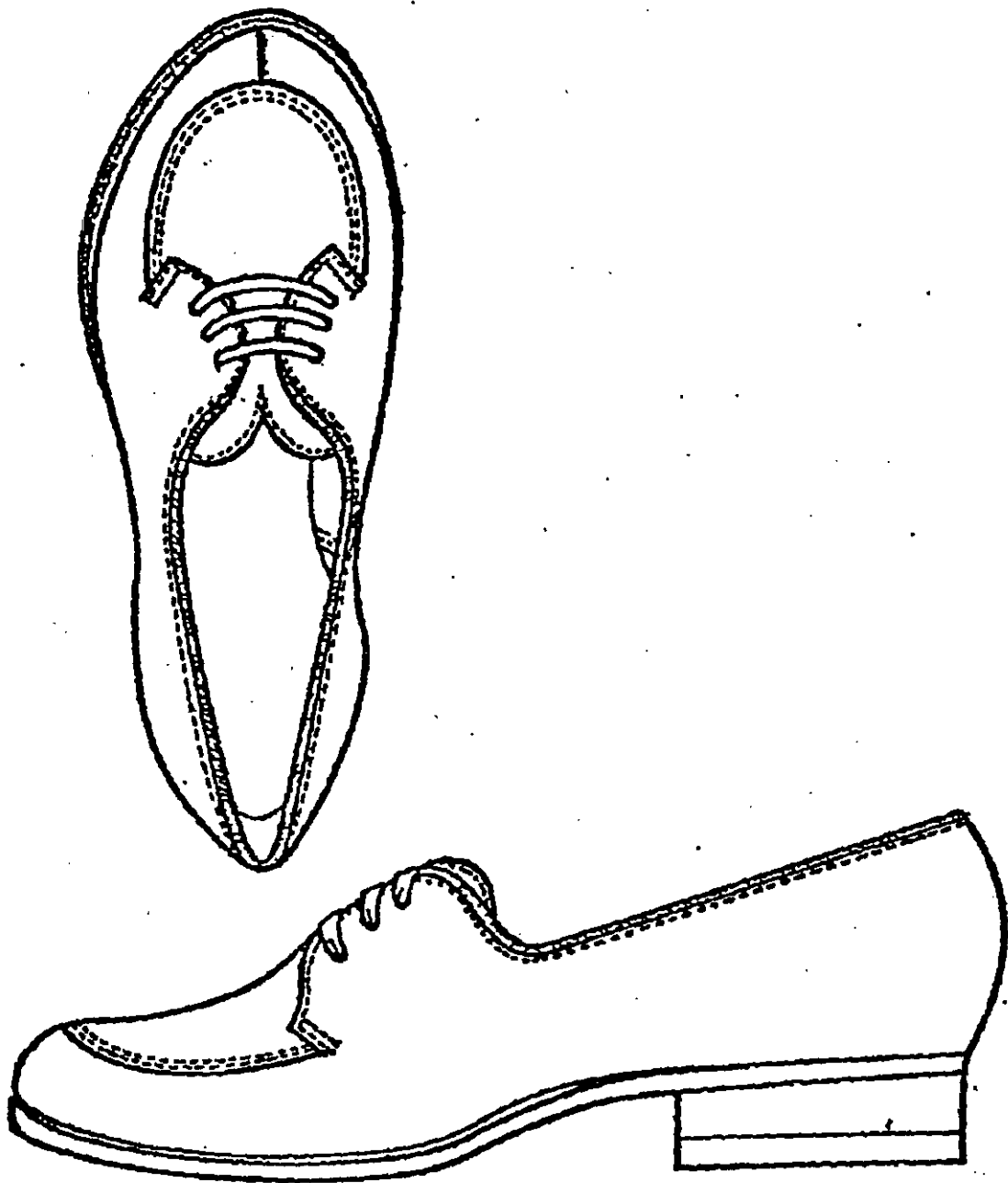


Figure 1. SHOES, WOMEN'S