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SUPERSEDING
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MILITARY SPECIFICATION

LASTS, FOOTWEAR, SHOE, MEN'S, U.S. MIL-1

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document covers plastic footwear lasts used in the manufacture of oxford and service shoes.

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

TABLE I. Schedule of sizes

Schedule of widths	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15
XN	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
XW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 8335

2. APPLICABLE DOCUMENTS

* 2.1 Government documents. Unless otherwise specified, the following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this document to the extent specified herein:

SPECIFICATIONS

FEDERAL

V-T-276	-	Thread, Cotton
CCC-C-467	-	Cloth, Burlap, Jute (or Kenaf)
PPP-B-640	-	Boxes, Fiberboard, Corrugated, Triple-Wall

STANDARDS

FEDERAL

FED-STD-751	-	Stitches, Seams, and Stitchings

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-130	-	Identification Marking of U.S. Military Property
MIL-STD-147	-	Palletized Unit Loads
MIL-STD-731	-	Quality of Wood Members for Containers and Pallets

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. Unless otherwise specified, the following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 1248	-	Polyethylene Plastics Molding and Extrusion Materials
E 18	-	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

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

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

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

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.6).

3.3 Material (see 6.7).

3.3.1 Polyethylene blocks. The lasts shall be made from polyethylene blocks. The polyethylene blocks shall be made from solid high density polyethylene without fillers, conforming to types III or IV, category 4 or 5 of ASTM D 1248 except that the density of type IV shall not exceed 0.965. The color shall be the standard color used by the contractor. The blocks shall be made from virgin material, or reground scrap material of the same composition produced by regrinding clean unburned scrap produced in the fabrication of last blocks, finished lasts, and imperfect lasts. Scrap containing dirt or other foreign material shall not be used.

3.3.2 Metal hinges. The metal hinges shall be a commercial type made of steel and zinc chromated to resist moisture.

3.3.3 Hinge pins. The hinge pins shall be made of steel wire and shall be heat treated to a hardness value of 45 to 50 Rockwell C scale of ASTM E 18. The pins shall be not less than 15/64 inch nor more than 19/64 inch in diameter. The pins shall be countersunk under the surface of the sides of the lasts. The pins shall be zinc chromated to resist moisture and shall be mechanically peened.

3.3.4 Thimbles. The thimbles shall be manufactured from steel sheet or tubing stock and shall be heat treated to a hardness value of 55 to 88 Rockwell B scale of ASTM E 18. The thimbles shall be of the drawn, split, or swaged tubing types. All thimbles shall be full-flanged with a closed or partially closed bottom, and shall be the locked-in type. Dimensions for last thimbles shall correspond to the following when tested in 4.4.1.

Inside diameter	0.500 ± 0.046 inch
Overall length	1.625 ± 0.063 inches
Depth of hole	1.500 ± 0.063 inches
Wall thickness	0.0475 ± 0.095 inch
Flange diameter	0.750 ± 0.063 inch

3.3.5 Heelplates. The heelplates shall be not less than 3-1/8 inches long on size 8R, shall measure proportionate to normal grade on other sizes, and shall have a 1/2 ± 1/32 inch hole in the center for insole tacking and five countersunk nail holes as specified in 3.5.3. The heelplates shall be made from either hot-galvanized or electro-galvanized sheet steel 0.050 ± 0.005 inch thick and shall be treated to a hardness value of 48 to 67 Rockwell B scale of ASTM E 18.

3.3.6 Heelplate attaching nails. The nails for attaching the heelplate on the last shall be 15 or 16 gage, 5/8 to 3/4 inch long, barbed, iron wire nails with 1/8 ± 1/32 inch diameter flat heads and ringed chisel points; and shall not be cement coated finish when tested as specified in 4.4.1.

3.3.7 Ink. Ink for marking the lasts shall be black, shall not blur, shall meet the marking adhesion requirements in 3.9.1, and shall be set permanently into the lasts by heat.

3.4 Models, patterns, and templates.

3.4.1 Turning models. Turning models for each of the sizes and widths required will be furnished by the Government (see 6.4). Turning models shall be in whole sizes in widths XN, N, R, W, XW, with the final measurements for the lasts of that size plainly marked on each model. Only two sizes shall be turned from any model up to size 12, namely, the model size and one-half size up. No last shall be turned from a model of a different width. Sizes larger than 12 shall be turned from the size 12 models.

3.4.2 Replacement of turning models. Models worn to the point of unserviceability in the production of properly graded lasts will be replaced by the Government. All models shall be returned to the Government at the close of the contract. Worn models that need replacement shall be marked "Unserviceable".

3.4.3 Last bottom patterns. Necessary turning bottom patterns and finished bottom patterns marked to indicate all pertinent measurements in geometric points, will be loaned to the contractor by the Government (see 6.4). When prehinging method is used, the turning bottom patterns do not apply.

3.4.4 Templates. Templates for use in checking the lasts will be loaned to the contractor by the Government (see 6.4).

3.5 Construction.

3.5.1 Hinge cutting, slotting, and assembly. The hinge V-cut and circle sawcut shall correspond to the hinge pin holes so that the last, with a correctly inserted hinge, will open and close in a satisfactory manner. All inside sharp corners on the plastic lasts shall have a slight radius made by running over the edge with a hot wire to eliminate stress risers made by cutters during the hinge cutting operation. The use of a radius ground cutter

to eliminate stress risers shall be permitted. As an alternate, the equipment and method used for prehinging is permitted.

3.5.2 Thimble hole. The thimble hole shall be bored to such a size that when the thimble is inserted in the last, it shall be locked into the plastic. Thimbles shall be countersunk on lasts. On sizes 7-1/2 through 12 (all widths), the thimble hole shall be centered 1-1/2 ± 1/16 inches from the back of the last top. On sizes below 7-1/2 and above 12, the holes shall be centered 1-3/8 and 1-5/8 ± 1/16 inches, respectively, from the back of the last top.

3.5.3 Heelplating. The heelplate on the finished last shall be flush with but not overlaying the outside edge of the last. A narrow margin of plastic, having a maximum width of not more than 1/16 inch in the curved area beginning 3/8 inch from the breast line of the plate, is acceptable. The margin of plastic in the area 3/8 inch from the breast line on each side of the plate is not limited. The breast of the heelplate shall butt up to the plastic. The heelplates shall be attached with five nails specified in 3.3.7. The position of the heel nails shall be according to commercial practice with five countersunk nail holes punched not less than 3/8 inch nor more than 5/8 inch from the edge of the plate, except that the two front nail holes shall be not less than 3/16 inch nor more than 3/8 inch from the breast of the heelplate. The side nails shall be located equidistant between the breast nails and the back nail. The heelplate shall be punched with a 1/2 ± 1/32 inch tack hole located approximately in the center of the heelplate, measuring both from the breast to the end of the heelplate and from side to side. The heelplate shall be cupped to conform to the contour of the heel seat of the last.

3.5.4 Heel and toe making. The heel and toe shall be shaped following the heel and toe profile templates as specified in table II. A tolerance of 1/2 size either upward or downward will be permitted in the applicable width for the toe.

TABLE II. Heel and toe templates

Widths	Sizes																								
	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½	15
XN	-	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
N	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
R	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
W	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
XW	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38

NOTE: Identical template numbers are for the same template regardless of width. The adjacent numbered templates are to be used for the tolerance for a given template, i.e., the tolerance for template 10 is 9 and 11.

3.6 Measurements and grading. The contractor shall check the turning models but shall make no modifications except for slight adjustments to fit the turning model bottom to the paper last bottom patterns furnished by the Government when this may be necessary due to swelling of the wood. The finished lasts shall conform to the templates listed in table II to the measurements listed in table III. Thickness of toes shall grade 10 points between whole sizes and 10 points between widths. The tolerance for the finished stick length shall be ± 1 point and for ball, waist, instep, and heel girth shall be ± 2 points. Finished last bottoms shall conform to measurements of finished last bottom patterns furnished by the Government with tolerance of ± 1/32 inch in length and ± 1/48 inch in width. All dimensions, except tolerances for bottom length and width, shall be taken by means of sticks and tapes whose calibrations are geometrically graded and which will be loaned by the Government (see 6.4).

TABLE III. Geometric measurements of U.S. MIL-1 lasts (see 6.5)

	Sizes											
Width	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½
XN -												
Ball -		980	985	990	995	1000	1005	1010	1015	1020	1025	1030
Waist -		977	982	987	992	997	1002	1007	1012	1017	1022	1027
Instep -		995	1000	1005	1010	1015	1020	1025	1030	1035	1040	1045
Heel -		1134	1139	1144	1149	1154	1159	1164	1169	1174	1179	1184
Length -		1078	1083	1088	1093	1098	1103	1108	1113	1118	1123	1128

Width	10	10½	11	11½	12	12½	13	13½	14	14½	15
XN -											
Ball	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085
Waist	1032	1037	1042	1047	1052	1057	1062	1067	1072	1077	1082
Instep	1050	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100
Heel	1189	1194	1199	1204	1209	1214	1219	1224	1229	1234	1239
Length	1133	1138	1143	1148	1153	1158	1163	1168	1173	1178	1183

TABLE III. Geometric measurements of U.S. MIL-1 lasts (see 6.5) (cont'd)

	Sizes											
Width	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½
N -												
Ball	995	1000	1005	1010	1015	1020	1025	1030	1035	1040	1045	1050
Waist	992	997	1002	1007	1012	1017	1022	1027	1032	1037	1042	1047
Instep	1010	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1065
Heel	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180	1185	1190
Length	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125	1130

Width	10	10½	11	11½	12	12½	13	13½	14	14½	15
N -											
Ball	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105
Waist	1052	1057	1062	1067	1072	1077	1082	1087	1092	1097	1102
Instep	1070	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120
Heel	1195	1200	1205	1210	1215	1220	1225	1230	1235	1240	1245
Length	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180	1185

Width	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½
R -												
Ball	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1065	1070
Waist	1012	1017	1022	1027	1032	1037	1042	1047	1052	1057	1062	1067
Instep	1030	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085
Heel	1141	1146	1151	1156	1161	1166	1171	1176	1181	1186	1191	1196
Length	1077	1082	1087	1092	1097	1102	1107	1112	1117	1122	1127	1132

TABLE III. Geometric measurements of U.S. MIL-1 lasts (see 6.5) (cont'd)

Width	Sizes										
	10	10½	11	11½	12	12½	13	13½	14	14½	15
R -											
Ball	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125
Waist	1072	1077	1082	1087	1092	1097	1102	1107	1112	1117	1122
Instep	1090	1095	1100	1105	1110	1115	1120	1125	1130	1135	1140
Heel	1201	1206	1211	1216	1221	1226	1231	1236	1241	1246	1251
Length	1137	1142	1147	1152	1157	1162	1167	1172	1177	1182	1187

Width	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½
W -												
Ball	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085	1090
Waist	1032	1037	1042	1047	1052	1057	1062	1067	1072	1077	1082	1087
Instep	1050	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105
Heel	1147	1152	1157	1162	1167	1172	1177	1182	1187	1192	1197	1202
Length	1079	1084	1089	1194	1099	1104	1109	1114	1119	1124	1129	1134

Width	10	10½	11	11½	12	12½	13	13½	14	14½	15
W -											
Ball	1095	1100	1105	1110	1115	1120	1125	1130	1135	1140	1145
Waist	1092	1097	1102	1107	1112	1117	1122	1127	1132	1137	1142
Instep	1110	1115	1120	1125	1130	1135	1140	1145	1150	1155	1160
Heel	1207	1212	1217	1222	1227	1232	1237	1242	1247	1252	1257
Length	1139	1144	1149	1154	1159	1164	1169	1174	1179	1184	1189

TABLE III. Geometric measurements of U.S. MIL-1 lasts (see 6.5) (cont'd)

Width	Sizes											
	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½
XW -												
Ball	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105	1110
Waist	1052	1057	1062	1067	1072	1077	1082	1087	1092	1097	1102	1107
Instep	1070	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125
Heel	1153	1158	1163	1168	1173	1178	1183	1188	1193	1198	1203	1208
Length	1081	1086	1091	1096	1101	1106	1111	1116	1121	1126	1131	1136

Width	10	10½	11	11½	12	12½	13	13½	14	14½	15
XW -											
Ball	1115	1120	1025	1130	1135	1140	1145	1150	1155	1160	1165
Waist	1112	1117	1122	1127	1132	1137	1142	1147	1152	1157	1162
Instep	1130	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180
Heel	1213	1218	1223	1228	1233	1238	1243	1248	1253	1258	1263
Length	1141	1146	1151	1156	1161	1166	1171	1176	1181	1186	1191

3.7 Marking.

3.7.1 Size and width stamping. The sawcut of the heel part shall be legibly rubber-stamped with the proper size of the last using ink specified in 3.3.7. The numerical size shall be stamped on the left of the hinge cut and start no more than 3/16 inch from the bottom of the sawcut. The adjectival width (XN, N, R, W, or XW) shall be stamped on the heel part of the sawcut at the right side of the available space and placed so that bottoms of letters are within 1/16 inch of the top of the last. Characters for sawcut stamping shall be not less than 1/2 inch nor more than 3/4 inch in height and not less than 1/4 inch nor more than 3/8 inch in width. All sawcut stamping shall be readable when viewed from directly above the thimble. In addition to the stamping on the sawcut, the size and width designations shall be plainly rubber-stamped on the outside of the last, just ahead of the sawcut, 1-1/2 ± 1/2 inches from the top of the cone, to read horizontally. Characters for this stamping shall be the same size as for sawcut stamping. The adjectival width designation shall be on a line with the size designation. The size and width shall be legibly die stamped (incised) on the forepart of

the last in the hollow area at the lowest point on profile line from cone to toe. Ink marking on the last shall be permanently set into the plastic by heat (see 3.3.7).

3.7.2 Marking for identification. In accordance with MIL-STD-130, an identifying inscription shall be marked (incised) with a die stamp on the outside surface of each last using not less than 3/8 inch nor more than 1/2 inch characters. The inscription shall be as follows: "U.S. MIL-1". In addition, the name or symbol of the contractor shall be plainly rubber-stamped on the inside surface of the back part of each last using ink specified in 3.3.7.

3.8 Finish. The lasts shall be clean and free of plastic hairs, strings, flash, or sprues and shall have no prominent turning gouges of any kind on the surface. All sharp edges in V-cut or sawcut shall be given a noticeable radius. Depressions, bumps, or holes of any kind arising from improper turning or interior voids in the block which appear on the surface of the last shall be cause for rejection.

3.9 Physical requirements.

3.9.1 Resistance to acetone. The marking on the finished lasts shall show no change in appearance when tested as specified in 4.4.5.

3.9.2 Resistance to impact. The finished last shall show no chipping or cracking, and shall not be deformed so as to be unserviceable when tested as specified in 4.4.5.

3.9.3 Hinge performance. The finished last shall show no cracking, breaking, chipping, or other defect which would make the last unserviceable when the last is broken and reclosed 100 times as specified in 4.4.5.

3.9.4 Tack resistance. The finished last shall show no splitting, chipping, cracking, or other defect which would render the last unserviceable when tested with insole tacks as specified in 4.4.5.

3.10 Replacement of defective components. During the manufacturing process, components having material defects or damages that are classified as defects in 4.4.3 shall be removed from production and replaced with non-defective and properly matched components.

3.11 Workmanship. The finished lasts shall conform to the quality of product established by this document. 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 or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the document shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicted or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 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 Classification of inspection. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).
b. Quality conformance inspection (see 4.4).

4.3 First article inspection. When a first article is required (see 3.2), it shall be examined for the defects specified in 4.4.3 and 4.4.4 and tested for the characteristics specified in table V. The presence of any defect or failure to pass any test shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

* 4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

* 4.4.1.1 Component and material certification. Components and materials listed below shall be accepted on the basis of a contractor's certificate of compliance with the indicated requirements.

Component or material	Requirement	Requirement paragraph
Polyethylene block	Material identification	3.3.1
	Density	3.3.1
Hinge metal	Material identification	3.3.2
	Zinc chromated	3.3.2
Hinge pin	Material identificaiton	3.3.3
	Hardness value	3.3.3
	Diameter	3.3.3
	Zinc chromated	3.3.3
Thimble	Material identification	3.3.4
	Hardness value	3.3.4
	Inside diameter	3.3.4
	Overall length	3.3.4
	Depth of hole	3.3.4
	Wall thickness	3.3.4
	Flange diameter	3.3.4
Heelplate	Material identification	3.3.5
	Hardness value	3.3.5
	Thickness	3.3.5
	Galvanized	3.3.5
Nails	Material identification	3.3.6
	Finish	3.3.6
	Length, head diameter, and gage	3.3.6

4.4.2 In-process inspection. Inspection shall be made at any point or during any phase of manufacturing 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 nonconformance.

* 4.4.3 End item visual examination. The last shall be examined for the defects listed below. The lot size shall be expressed in units of one last. The sample unit shall be one completely fabricated last and the selection shall be by pairs. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0.

Examine	Defect
Pairing	Not right and left of same size.
Finish	Contains plastic hairs, strings, flash, or sprues. Depression, bump, hole, or void. Prominent turning gouge on surface.
Construction and workmanship	Surface of last that will come in contact with the footwear, not smoothly finished, i.e., protrusion, or rough area. Part misplaced or out of alignment. Heel end and forepart of last not joined flush, i.e., any step or ridge over 1/64 inch in the outside joint area that will come in contact with the footwear. Breast of heelplate to plastic not a tight flush fit. Part not recessed in plastic where required, or not recessed. Operation omitted or not properly performed. Functioning part that will not operate as required or requires abnormal force to operate. Part missing or damaged. Nail missing, head bent over, or protruding. Nail misplaced. Sharp edge. Margin of plastic, along back and side edge of heelplate beginning 3/8 inch from the breast line, is more than 1/16 inch.
Marking	Omitted, incorrect, illegible, incomplete, not accomplished in the specified manner, size of characters not as specified, not in proper location.

* 4.4.4 End item dimensional examination. The last shall be examined for conformance to the measurements and template requirements in 3.6. Any measurement or template that is not within the established tolerance shall be classified as a defect. The lot size shall be expressed in units of one last. The sample unit shall be one completely fabricated last and the selection shall be by pairs. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units shall be 4.0.

4.4.5 End item testing. The lasts shall be tested for the characteristics listed in table V. The lot size shall be expressed in units of one last. The sample unit shall be four lasts. For each test characteristic one determination shall be made and the results reported as pass or fail. All test requirements shall be applicable to the sample unit. All test reports shall contain the individual values used to express the final result. The lot shall be unacceptable if one or more sample units fail to meet any test requirement. The sample size shall be as follows:

Lot size	Sample size
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

TABLE V. End item tests

End item	Characteristic	Requirement paragraph	Test method
Finished last	Resistance to acetone	3.9.1	4.5.1
	Resistance to impact	3.9.2	4.5.2
	Hinge performance	3.9.3	4.5.3
	Tack resistance	3.9.4	4.5.4

* 4.4.6 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL expressed in terms of defects per hundred units, shall be 2.5.

Examine	Defect
Marking	Omitting; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing, damaged or not as specified.
Workmanship	Seams and stitching of bag not as specified. Closure of bag not as specified or incomplete. Inadequate application of components such as: incomplete closure of container flaps, improper taping, loose strapping, or inadequate stapling. Bulged or distorted container.
Content	Number of pairs of lasts per bag is more or less than required. Wrong size or width of pairs of lasts included in bag.

* 4.4.7 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

Examine	Defect
Finished dimensions	Length, width, or height exceeds specified maximum requirements.
Palletization	Pallet pattern not as specified. Interlocking of loads not as specified. Load not bonded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted;; incorrect; illegible; of improper size, location, sequence, or method of application.

4.5 Methods of inspection.

4.5.1 Resistance to acetone test. The finished last shall be wet in a test area including marking, with acetone for 5 minutes (e.g., using a soaked cotton wad). The finish shall be tested by attempting to scrape through the test area with the thumbnail. The last shall be examined for softening of the finish, change in marking, and change in appearance from adjacent finish.

4.5.2 Resistance to impact test. The finished last shall be tested by dropping an 8-pound solid iron or steel ball so as to strike the last in the following spots (the ball shall be dropped from a height of 2 feet, measured between the bottom of the ball and the point of impact on the last):

a. With the last resting on its side, the ball shall strike over the rear hinge pin hole, over the front hinge pin hole, and at the edge of the ball line midway between the hinge and the toe.

b. With the last resting on the heel end, the ball shall strike the last on the tip of the toe.

Tests shall be repeated three times in each spot. In the (a) position, repeat on both the outside and inside of the last. The last shall be inspected for breaking, splitting, cracking, or other defects rendering the last unserviceable, other than directly at the impact area.

NOTE: The last may conveniently be held by a large C-clamp between the thimble and the heel plate and shall be placed on a concrete floor.

4.5.3 Hinge performance test. The last shall be placed on a regular last spindle and shall be broken and reclosed 100 times. This may be done by hand or by an appropriate hydraulic or mechanical mechanism. Examination shall be made for defects developed by this test.

* 4.5.4 Tack resistance test. The finished last shall be tested by driving insole tacks into the bottom surface of the last, 1/4 inch in from the edge, around the periphery from inside to outside ball area. The tacks shall be driven 1/4 inch deep and shall be spaced 1/2 inch apart. The last shall be examined for splitting, chipping, cracking, or other defects rendering the last unserviceable.

5. PACKAGING

* 5.1 Packing. Packing shall be level B.

* 5.1.1 Level B. Twelve pairs of lasts of one size and width only shall be packed in a bag fabricated from jute (or kenaf) burlap cloth conforming to class 4 of CCC-C-467. The sides and bottoms of the bags shall be seamed with seam type SSd-1 or SSn-1 and with stitch type 101 or 401 conforming to FED-STD-751. The edges of the material shall be turned 3/8 to 1/2 inch and the stitching placed 3/16 to 5/16 inch from the turned edge of the bag. The thread for seaming the bags shall be cotton thread conforming to type IIIA of V-T-276. Ticket No. 10, five-ply thread shall be used as the needle thread for stitch type 101 and 401. Ticket No. 10, three-ply thread shall be used as the looper thread for stitch type 401. The seam shall be sewn with 3 to 6 stitches per inch. Each bag shall be closed with two wire ties. Five inches of surplus covering shall be gathered together to form an ear with the first wire tie applied as close to the ear base as possible. The second wire tie shall be approximately 1 inch from the first wire tie, with the twisted ends positioned opposite to the ends of the first wire tie. The wire ties shall be not less than 6 inches long, 0.072 inch diameter soft iron or steel wire with a 1/2 inch diameter formed eye at each end. Bags of lasts shall then be packed in a triple-wall corrugated fiberboard container conforming to class 1, style G of PPP-B-640. The approximate outside container dimensions shall be 48 inches in length, 40 inches in width and 48 inches in depth. Toward the end of the contract or when there are less than the required amount per container of the same size and width, mixed sizes and widths may be packed within the same container.

* 5.2 Palletization. When specified (see 6.2), lasts, packed as specified in 5.1.1, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet type shall be type I (4-way entry), type IV or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means K and L or film bonding means O or P. Pallet pattern 83 shall be used in accordance with the appendix of MIL-STD-147.

5.3 Marking. In addition to any special marking required by the contract or purchase order, shipping containers and palletized unit loads shall be marked in accordance with MIL-STD-129.

* 5.3.1 Labels, mixed sizes. Each shipping container packed with mixed sizes and or widths 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 NSN's" plainly stamped or printed thereon and under these words shall be legibly stamped or printed the correct quantity and NSN's contained therein.

6. NOTES

6.1 Intended use. The lasts are intended for use as a base over which oxford dress shoes and service shoes for male military personnel of the Department of Defense may be manufactured.

* 6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this document.
b. Sizes and widths required (see 1.2).
c. When a first article is required (see 3.2, 4.3, and 6.6).
d. When palletization is required (see 5.2).

6.3 Sample. For access to sample, address the contracting activity issuing the invitation for bids.

6.4 Government-furnished property. (To be loaned by the Government to the contractor for life of contract in sizes necessary for performance of contract.)

a. Last turning models, whole sizes only.
b. Bottom patterns, turning.
c. Bottom patterns, finishing.
d. Heel curve templates, unfinished.
e. Heel curve templates, finished.
f. Toe curve templates.
g. Geometrically graded last sticks.
h. Geometrically graded last measuring tapes.

6.5 Conversion formula. If it is desired to convert geometric points to inches, the following formula may be used.

$$L = (0.3937)\ (1.002998)N$$

Where

L = dimension in inches
N = number of geometric points

* 6.6 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in all acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.7 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this document (see 3.3).

6.8 Changes from previous issue. The margins of this document 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

Review activities:

Army - MD
Air Force - 11, 82
DLA - CT

User activity:

Navy - MC

Preparing activity:

Army - GL

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