

GGG-F-331b

October 14, 1966

SUPERSEDING

Fed. Spec. GGG-F-331a

October 7, 1957

(See 6.5)

FEDERAL SPECIFICATION
FILE, HAND (SWISS PATTERN)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers Swiss pattern hand files.

1.1.1 Federal specification coverage. This specification does not include all types, classes, and sizes of hand files commercially available, but only those generally used by the Federal Government.

1.2 Classification.

1.2.1 Types and classes. Swiss pattern hand files shall be of the following types and classes, as specified (see 6.2):

Type:

- I—Barrette.
- III—Crochet.
- IV—Crossing.
- V—Equaling.
- VI—Half-round.
- VII—Hand.
- VIII—Joint.

Class:

- 1—Round-edge, thick.
- 2—Round-edge, thin.
- 3—Square-edge, thick.
- 4—Square-edge, thin.

- IX—Knife.
- XI—Pillar.

Class:

- 1—Extra-narrow.
- 2—Narrow.
- 3—Regular.

XII—Pippin.

XIII—Round.

Class:

- 1—Straight.
- 2—Taper.

XIV—Slitting.

XV—Square.

XVI—Three-square.

XVII—Warding.

XVIII—Needle.

Class:

- 1—Round.
- 2—Half-round.
- 3—Three-square.
- 4—Crossing.
- 5—Knife.
- 6—Flat.
- 7—Square.
- 8—Barrette.
- 9—Joint, round-edge.
- 10—Equaling.
- 11—Slitting.
- 12—Marking, half-round.

XX—Diesinkers rifflers, regular.

Class:

- 1—No. 1.
- 2—No. 2.
- 3—No. 3.
- 4—No. 4.
- 5—No. 5.
- 6—No. 6.
- 7—No. 7.
- 8—No. 8.
- 9—No. 9.
- 10—No. 10.
- 11—No. 11.

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- 12—No. 12.
- 13—No. 13.
- 14—No. 14.
- 15—No. 15.
- 16—No. 16.
- 17—No. 17.
- 18—No. 18.

Type XXI—Screwhead.

Class:

- 1—With tang.
- 2—Without tang.

Type XXII—Contact-point.

2. APPLICABLE DOCUMENTS

2.1 The following specifications and standards, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

Federal Specification:

QQ-S-634—Steel, Bar, Carbon, Cold Finished, (Standard Quality).

Federal Standard:

Fed. Std. No. 123—Marking for Domestic Shipment (Civilian Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, and Seattle, Wash.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specification:

MIL-H-15424—Hand Tools, Packaging of.

Military Standards:

MIL-STD-105—Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129—Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 **Qualification.** The Swiss pattern files furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.2 and 6.3).

3.2 **Illustrations.** The illustrations herein are descriptive and not restrictive, and are included for the convenience of requisitioning and purchasing officers and manufacturers. They are not intended to preclude the purchase of hand files which are otherwise in accordance with this specification.

3.3 **Machine cutting.** The amount of steel removed by one side of each file in 20,000 strokes, when tested in accordance with 4.6, shall be not less than the following (see 6.2):

File	Length of bar removed	
	Minimum average	Minimum individual
	<i>Inches</i>	<i>Inch</i>
Type VII (hand), No. 00 cut-----	1.25	1.00

3.4 **Pattern.** The height and form of teeth, the number of teeth per inch, and the overall file shape and size of each individual type, class, cut number, and length shall

be readily identifiable commercially as characteristic of Swiss pattern hand files.

3.5 File teeth. Teeth of any individual surface or edge shall be uniformly cut (or etched) and of uniform height throughout the fully cut portion. There shall be no defective, missing, or misformed teeth. All the teeth shall be hard, sharp, and free from decarburization or such brittleness as might cause breakage under normal conditions of service.

3.5.1 Cut numbers. The cut numbers of Swiss pattern files are shown in the applicable tables for the individual types and classes. Files shall be furnished in the cut numbers specified (see 6.2).

3.5.2 Single-cut and double-cut surfaces. A single-cut surface shall have one set of parallel cuts on the surface. A double-cut surface shall have two sets of parallel cuts on the surface, one set crossing the other, with the heel end of one set of lines at one edge of the cut surface, and the heel end of the other set at the opposite edge.

3.5.3 Number of teeth per inch. The number of teeth per inch shall be the number of parallel lines of cuts counted on the surface in a distance of 1 inch parallel with the longitudinal center line of the surface. A plus or minus tolerance of 5 percent is permitted in the number of teeth per inch.

3.6 Tangs. Each file, with the exception of types XVIII, XX, XXI, class 2, and type XXII files, shall be provided with a tang of conventional shape and size to which a handle may be attached.

3.7 Heat treatment. The cutting surfaces of all files shall be heat-treated to a uniform hardness. When tanged, the tang shall be tempered to a hardness value not greater than Rockwell C 30 at a point approximately midway of its length and width.

3.8 Length. The length of types XVIII, XX, XXI, class 2, and type XXII files shall be the overall length. The length of all other files shall be measured from the point (free or front end) to the heel (junction of the tang with the remainder of the file).

3.9 Tolerances.

3.9.1 Length. Unless otherwise noted in the applicable table, tolerances for length of files shall be not less than that specified and not more than 10 percent longer.

3.9.2 Cross section. Tolerances for cross-sectional dimensions shall be as specified in the applicable table.

3.10 Material. Files shall be made of steel of a chemical composition which, together with the shape, height, and method of cutting (or etching) of the teeth and subsequent hardening by heat treatment, results in the production of files having long-cutting life and good-cutting qualities.

3.11 Condition. Files shall be clean and free from scale and rust.

3.12 Identification marking. Each file shall be stamped in a plain and permanent manner with the name of the manufacturer, or with a trademark of such known character that the source of manufacture may be readily determined. The files shall also be plainly and permanently marked with the cut number.

3.13 Type I, barrette files. Barrette files shall be similar to figure 1 and shall conform to the requirements shown in table I for the cut and length specified (see 6.2). Files shall taper in both width and thickness at least one-third of the length to the point, with relatively sharp taper in width so as to produce a pointed end. The included angle of the beveled surfaces with the wide, flat surface shall be 31 to 36°, inclusive. Files shall be double cut on wide flat side only, with the narrow side (back) and beveled surface uncut (safe).

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TABLE I. Type I, barrette files

Cut Number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>		<i>Inch</i>	<i>Degrees</i>
00-----	3	11/32	3/32	54	0.004	2
	4	1/2	1/8	42	.004	2
	6	21/32	5/32	38	.006	2
	8	7/8	3/16	34	.008	2
0-----	3	11/32	3/32	64	.004	2
	4	1/2	1/8	54	.004	2
	6	21/32	5/32	50	.006	2
	8	7/8	3/16	46	.008	2
1-----	4	1/2	1/8	72	.004	2
	6	21/32	5/32	66	.006	2
2-----	3	11/32	3/32	96	.004	2
	4	1/2	1/8	92	.004	2
	6	21/32	5/32	84	.006	2
	8	7/8	3/16	80	.008	2
4-----	3	11/32	3/32	146	.004	2
	4	1/2	1/8	130	.004	2
	6	21/32	5/32	120	.006	2

Tolerances for lengths 6 inches and shorter: Dim. A= $\pm 1/32$.
Dim. B= $\pm 1/64$.

Tolerances for lengths longer than 6 inches: Dim. A= $\pm 1/32$.
Dim. B= $\pm 1/32$.



FIGURE 1. Type I, barrette.

3.14 Type III, crochet files. Crochet files shall be similar to figure 2, and shall conform to the requirements shown in table II

for the cut and length specified (see 6.2). Files shall taper in both width and thickness from heel to the point so as to produce a pointed end, have either semicircular or well-rounded edges, be double cut on each side, and be double cut on each edge in a manner identical with the sides.



FIGURE 2. Type III, crochet.

3.15 Type IV, crossing files. Crossing files shall be similar to figure 3 and shall conform to the requirements shown in table III

for the cut and length specified (see 6.2). Files shall taper in both width and thickness from at least the middle of the cut length of the file to the point so as to produce a pointed end. The radius of curvature of the surfaces shall be such that one surface has a flatter curvature than the other, and shall be double cut on each surface.

TABLE II. Type III, crochet files

Cut number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>		<i>Inch</i>	<i>Degrees</i>
00-----	4	3/8	3/32	42	0.004	2
	6	1/2	1/8	38	.006	2
	8	21/32	5/32	34	.008	2
	10	13/16	3/16	32	.010	2
0-----	4	3/8	3/32	54	.004	2
	6	1/2	1/8	50	.006	2
	8	21/32	5/32	46	.008	2
	10	13/16	3/16	36	.010	2
2-----	4	3/8	3/32	92	.004	2
	6	1/2	1/8	84	.006	2
	8	21/32	5/32	80	.008	2
	10	13/16	3/16	66	.010	2
4-----	4	3/8	3/32	130	.004	2
	6	1/2	1/8	120	.006	2

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
 Dim. B = $\pm 1/64$.
 Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/16$.
 Dim. B = $\pm 1/32$.

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TABLE III. Type IV, crossing files

Cut number	Length	Dimensions of largest section		Number of teeth per inch
		A	B	
	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>	
00-----	4	7/16	7/64	38
	6	5/8	3/16	34
	8	25/32	15/64	30
0-----	4	7/16	7/64	48
	6	5/8	3/16	40
	8	25/32	15/64	36
2-----	4	7/16	7/64	78
	6	5/8	3/16	62
	8	25/32	15/64	56
4-----	4	7/16	7/64	126
	6	5/8	3/16	114
	8	25/32	15/64	108
6-----	6	5/8	3/16	172

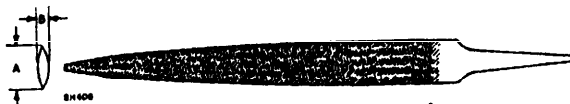


FIGURE 3. Type IV, crossing.

3.16 Type V, equaling files. Equaling files shall be similar to figure 4 and shall conform to the requirements shown in table IV for the cut and length specified (see 6.2). Files shall be of uniform width and thickness from heel to point, shall be double cut on each side, and shall have two square edges with each edge single cut.



FIGURE 4. Type V, equaling.

Tolerances for lengths Dim. A = $\pm 1/32$.
 6 inches and shorter: Dim. B = $\pm 1/64$.
 Tolerances for lengths Dim. A = $\pm 1/16$.
 longer than 6 inches: Dim. B = $\pm 1/16, -1/32$.

TABLE IV. Type V, equaling files

Cut Number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
	<i>Inches</i>	<i>Inch</i>	<i>Inch</i>		<i>Inch</i>	<i>Degrees</i>
00-----	4	13/32	5/64	38	0.004	2
	6	19/32	7/64	34	.006	2
	8	3/4	9/64	30	.008	2
0-----	3	5/16	1/16	58	.004	2
	4	13/32	5/64	54	.004	2
	6	19/32	7/64	50	.006	2
	8	3/4	9/64	46	.008	2
2-----	3	5/16	1/16	96	.004	2
	4	13/32	5/64	92	.004	2
	6	19/32	7/64	84	.006	2
	8	3/4	9/64	80	.008	2
4-----	4	13/32	5/64	130	.004	2
	6	19/32	7/64	120	.006	2
	8	3/4	9/64	116	.008	2

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
 Dim. B = $\pm 1/64$.
 Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/32$.
 Dim. B = $\pm 1/32$.

3.17 Type VI, half-round files. Half-round files shall be similar to figure 5 and shall conform to the requirements shown in table V for the cut and length specified (see 6.2). Files shall taper in both width and thickness at least one-third of the length to the point, and be double cut on each surface. The file shall show no visible distortion

when the flat side is placed on a flat surface.



FIGURE 5. Type VI, half-round.

TABLE V. Type VI, half-round files

Cut number	Length <i>Inches</i>	Dimensions of largest section		Number of teeth per inch		Allowable warpage, maximum <i>Degrees</i>
		A <i>Inch</i>	B <i>Inch</i>	Back	Flat	
00-----	3	9/32	3/32	50	54	2
	4	3/8	1/8	38	42	2
	5	7/16	1/8	36	40	2
	6	17/32	9/64	34	38	2
	8	23/32	13/64	30	34	2
0-----	10	29/32	1/4	26	32	2
	3	9/32	3/32	60	64	2
	4	3/8	1/8	48	54	2
	5	7/16	1/8	44	52	2
	6	17/32	9/64	40	50	2
1-----	8	23/32	13/64	36	46	2
	10	29/32	1/4	32	36	2
	6	17/32	9/64	48	66	2
	8	23/32	13/64	44	62	2
	2-----	3	9/32	3/32	94	96
4		3/8	1/8	78	92	2
5		7/16	1/8	70	88	2
6		17/32	9/64	62	84	2
8		23/32	13/64	56	80	2
3-----	10	29/32	1/4	50	66	2
	4	3/8	1/8	102	110	2
	5	7/16	1/8	98	106	2
	6	17/32	9/64	92	102	2
	8	23/32	13/64	82	98	2
4-----	3	9/32	3/32	140	146	2
	4	3/8	1/8	126	130	2
	5	7/16	1/8	120	126	2
	6	17/32	9/64	114	120	2
	8	23/32	13/64	108	116	2
6-----	10	29/32	1/4	98	102	2
	6	17/32	9/64	172	184	2

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
 Dim. B = $\pm 1/64$.
 Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/16$.
 Dim. B = $\pm 1/16, - 1/32$.

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3.18 Type VII, hand files. Hand files shall be similar to figure 6 and shall conform to the requirements shown in table VI for the cut and length specified (see 6.2). Files shall be of uniform width and shall be either parallel in thickness, or shall taper in thickness from heel to point and be double cut on each side. Files shall have two square

edges with one edge single cut and the other edge uncut (safe), except that cut numbers 4 and 6 shall have both edges uncut.



FIGURE 6. Type VII, hand.

TABLE VI. Type VII, hand files

Cut number	Length Inches	Dimensions of section A Inches	Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
				Inch	Degrees
00	6	3/4	34	0.006	2
	8	29/32	30	.008	2
	10	1-1/16	28	.010	2
	12	1-5/32	22	.012	2
0	4	17/32	54	.004	2
	6	3/4	50	.006	2
	8	29/32	46	.008	2
	10	1-1/16	36	.010	2
	12	1-5/32	30	.012	2
1	6	3/4	66	.006	2
	8	29/32	63	.008	2
2	4	17/32	92	.004	2
	6	3/4	84	.006	2
	8	29/32	80	.008	2
	10	1-1/16	66	.010	2
	12	1-5/32	54	.012	2
4	4	17/32	130	.004	2
	6	3/4	120	.006	2
	8	29/32	116	.008	2
	10	1-1/16	102	.010	2
6	6	3/4	184	.006	2
	8	29/32	176	.008	2

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.

Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/16, - 1/32$.

3.19 Type VIII, joint files.

3.19.1 Class 1, round-edge, thick, and class 2, round-edge, thin. Classes 1 and 2 files shall be similar to figure 7 and shall conform to the requirements shown in tables VII and VIII for the cut and length specified (see 6.2). Files shall be of uniform width and thickness from heel to point. The edges shall be semicircular and shall be double cut. Flat sides shall be safe.

3.19.2 Class 3, square-edge, thick, and class 4, square-edge, thin. Classes 3 and 4

files shall be similar to figure 7 except the edges shall be square and shall conform to the requirements shown in tables IX and X for the cut and length specified (see 6.2). Files shall be of uniform width and thickness from heel to point. The square edges shall be double cut. Flat sides shall be safe.

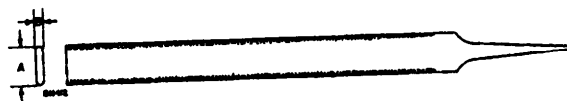


FIGURE 7. Type VIII, joint.

TABLE VII. *Type VIII, class 1, joint files, round-edge, thick*

Cut number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
2-----	Inches 4	$\pm 1/32$	$\pm 1/64$	88	Inch 0.004	Degrees 2
		Inch $\pm 13/32$	Inch 5/64			

TABLE VIII. *Type VIII, class 2, joint files, round-edge, thin*

Cut number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
2-----	Inches 4	$\pm 1/32$	$\pm 1/64$	88	Inch 0.005	Degrees 4
		Inch $\pm 13/32$	Inch 8/64			

TABLE IX. *Type VIII, class 3, joint files, square-edge, thick*

Cut number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
2-----	Inches 4	$\pm 1/32$	$\pm 1/64$	88	Inch 0.004	Degrees 2
		Inch $\pm 13/32$	Inch 5/64			

TABLE X. *Type VIII, class 4, joint files, square-edge, thin*

Cut number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
2-----	Inches 4	$\pm 1/32$	$\pm 1/64$	88	Inch 0.005	Degrees 4
		Inch $\pm 13/32$	Inch 8/64			

3.20 Type IX, knife files. Knife files shall be similar to figure 8 and shall conform to the requirements shown in table XI for the cut and length specified (see 6.2). Files shall taper in width and thickness at least one-third of the length to the point so as to produce a pointed end, have a knife cross section with an included angle between sides of 9 to 11°, inclusive, and be double cut on each flat side. Files shall have two square edges with the thin edge single cut and the back

edge uncut, or each edge single cut, except that back edges of number 4 cut files may have a double cut, at the option of the contractor.



FIGURE 8. Type IX, knife.

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TABLE XI. *Type IX, knife files*

Cut number	Length	Dimensions of section A	Number of teeth per inch		Allowable warpage, maximum
			Sides	Edges	
	<i>Inches</i>	<i>Inch</i>			<i>Degrees</i>
00-----	4	15/32	46	46	2
	6	21/32	42	42	3
	8	7/8	38	38	3
0-----	4	15/32	58	58	2
	6	21/32	54	54	3
	8	7/8	50	50	3
1-----	4	15/32	72	72	2
	6	21/32	66	66	3
	8	7/8	62	62	3
2-----	4	15/32	92	92	2
	6	21/32	84	84	3
	8	7/8	80	80	3
4-----	4	15/32	180	130	2
	6	21/32	120	120	3

Tolerances for lengths 6 inches and shorter:
Tolerances for lengths longer than 6 inches:

Dim. A = $\pm 1/32$.
Dim. A = $\pm 1/16$, - 1/32.

3.21 Type XI, pillar files. Pillar files shall be similar to figure 9 and shall conform to the requirements shown in tables XII, XIII, or XIV, as applicable, for the class, cut, and length specified (see 6.2). Files shall be of uniform width from heel to point, and shall be either parallel in thickness, or shall taper slightly in thickness toward the point.

Files shall be double cut on each surface, and have two square edges with each edge uncut (safe).



FIGURE 9. Type XI, pillar.

TABLE XII. *Type XI, class 1, pillar files, extra-narrow*

Cut number	Length	Dimensions of section A	Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
				<i>Inch</i>	<i>Degrees</i>
00-----	3	9/64	54	0.004	2
	4	3/16	42	.004	2
	6	1/4	38	.006	2
	8	5/16	34	.008	2
	10	3/8	32	.010	2
0-----	3	9/64	64	.004	2
	4	3/16	54	.004	2
	6	1/4	50	.006	2
	8	5/16	46	.008	2
	10	3/8	36	.010	2
1-----	4	3/16	72	.004	2
	6	1/4	66	.006	2
	8	5/16	62	.008	2

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TABLE XII. Type XI, class 1, pillar files, extra-narrow (Continued)

Cut number	Length	Dimensions of section A	Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
	<i>Inches</i>	<i>Inch</i>		<i>Inch</i>	
2-----	3	9/64	96	.004	2
	4	3/16	92	.004	2
	6	1/4	84	.006	2
	8	5/16	80	.008	2
	10	3/8	66	.010	2
4-----	4	3/16	180	.004	2
	6	1/4	120	.006	2
	8	5/16	116	.008	2
6-----	4	3/16	200	.004	2
	6	1/4	184	.006	2

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/32$.

TABLE XIII. Type XI, class 2, pillar files, narrow

Cut number	Length	Dimensions of section A	Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
	<i>Inches</i>	<i>Inch</i>		<i>Inch</i>	<i>Degrees</i>
00-----	4	17/64	36	0.004	2
	6	23/64	34	.006	2
	8	15/32	30	.008	2
	10	9/16	28	.010	2
0-----	4	17/64	54	.004	2
	6	23/64	50	.006	2
	8	15/32	46	.008	2
	10	9/16	36	.010	2
1-----	6	23/64	66	.006	2
	8	15/32	62	.008	2
2-----	4	17/64	92	.004	2
	6	23/64	84	.006	2
	8	15/32	80	.008	2
	10	9/16	66	.010	2
4-----	4	17/64	180	.004	2
	6	23/64	120	.006	2
	8	15/32	116	.008	2
6-----	4	17/64	200	.004	2
	6	23/64	184	.006	2

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/32$.

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TABLE XIV. Type XI, class 3, pillar files, regular

Cut number	Length	Dimensions of section A	Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
				Inch	Degrees
00-----	4	23/64	38	0.004	2
	6	31/64	34	.006	2
	8	39/64	30	.008	2
	10	47/64	28	.010	2
	12	53/64	22	.012	2
0-----	4	23/64	54	.004	2
	6	31/64	50	.006	2
	8	39/64	46	.008	2
1-----	3	19/64	76	.004	2
	4	23/64	72	.004	2
	6	31/64	66	.006	2
	8	39/64	62	.008	2
	10	47/64	50	.010	2
	12	53/64	38	.012	2
2-----	3	19/64	96	.004	2
	4	23/64	92	.004	2
	6	31/64	84	.006	2
	8	39/64	80	.008	2
	10	47/64	66	.010	2
	12	53/64	54	.012	2
3-----	6	31/64	102	.006	2
	8	39/64	98	.008	2
4-----	3	19/64	146	.004	2
	4	23/64	130	.004	2
	6	31/64	120	.006	2
	8	39/64	116	.008	2
	10	47/64	102	.010	2
6-----	4	23/64	200	.004	2

Tolerances for lengths 6 inches and shorter:
Tolerances for lengths longer than 6 inches:

Dim. A = $\pm 1/32$.
Dim. A = $\pm 1/32$.

3.22 Type XII, pippin files. Pippin files shall be similar to figure 10 and shall conform to the requirements shown in table XV for the cut and length specified (see 6.2). Files shall taper in both width and thickness at least one-third of the length to the point with a relatively sharp taper so as to produce a pointed end, and be double cut on each side. The round edge shall be double cut in

a manner identical with the sides. The sharp edge may be uncut (safe).



FIGURE 10. Type XII, pippin.

TABLE XV. Type XII, pippin files

Cut number	Length <i>Inches</i>	Dimensions of largest section		Number of teeth per inch
		A <i>Inch</i>	B <i>Inch</i>	
00-----	4	9/32	1/8	50
	6	3/8	5/32	38
	8	1/2	3/16	34
0-----	4	9/32	1/8	62
	6	3/8	5/32	48
	8	1/2	3/16	44
2-----	4	9/32	1/8	88
	6	3/8	5/32	76
	8	1/2	3/16	68

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
Dim. B = $\pm 1/64$.

Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/32$.
Dim. B = $\pm 1/32$.

3.23 Type XIII, round files.

3.23.1 *Class 1, straight.* Class 1 files shall be similar to figure 11 and shall conform to the requirements shown in table XVI for the cut and length specified (see 6.2). Files shall be of uniform diameter from the heel to point, and shall be double cut.



FIGURE 11. Type XIII, class 1, round, straight.

TABLE XVI. Type XIII, class 1, round files, straight

Cut number	Length <i>Inches</i>	Dimen- sions of section A <i>Inch</i>	Number of teeth per inch	Allow- able distortion, maxi- mum
				<i>Inch</i>
00-----	4	1/8	50	0.010
	6	3/16	38	.010
	8	1/4	30	.020
0-----	4	1/8	62	.010
	6	3/16	48	.010
	8	1/4	36	.020
2-----	4	1/8	88	.010
	6	3/16	76	.010
	8	1/4	68	.020
4-----	4	1/8	126	.010
	6	3/16	114	.010
	8	1/4	108	.020

Angle of cut teeth: Upcut teeth 15 to 25°; over- cut teeth 40 to 45°, inclusive.

Tolerances for dimension A: Plus or minus 1/32 inch.

3.23.2 *Class 2, taper.* Class 2 files shall be similar to figure 12 and shall conform to the requirements shown in table XVII for the cut and length specified (see 6.2). Files shall taper in diameter at least one-third of the length to the point so as to produce a pointed end, and shall be double cut.



FIGURE 12. Type XIII, class 2, round, taper.

TABLE XVII. Type XIII, class 2, round files, taper

Cut number	Length <i>Inches</i>	Dimen- sion of largest section A <i>Inch</i>	Number of teeth per inch	Allow- able dis- tortion, maxi- mum
				<i>Inch</i>
00-----	3	5/64	56	0.010
	4	1/8	50	.010
	5	5/32	44	.010
	6	3/16	38	.010
	8	1/4	30	.020
0-----	10	21/64	26	.025
	3	5/64	68	.010
	4	1/8	62	.010
	5	5/32	56	.010
	6	3/16	48	.010
0-----	8	1/4	36	.020
	10	21/64	32	.025
	3	5/64	80	.010
	4	1/8	74	.010
	6	3/16	60	.010
1-----	8	1/4	44	.020
	10	21/64	38	.025
	3	5/64	94	.010
2-----	4	1/8	88	.010
	5	5/32	84	.010
	6	3/16	76	.010
	8	1/4	68	.020
	10	21/64	64	.025
3-----	3	5/64	120	.010
	4	1/8	102	.010
	5	5/32	98	.010
	6	3/16	92	.010
3-----	8	1/4	82	.020

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TABLE XVII. *Type XIII, class 2, round files, taper (Continued)*

Cut number	Length	Dimension of largest section A	Number of teeth per inch	Allowable distortion, maximum
	<i>Inches</i>	<i>Inch</i>		
4-----	3		140	.010
	4	5/64	126	.010
	5	1/8	120	.010
	6	5/32	114	.010
	8	3/16	108	.020
6-----		1/4	200	
	3	5/64		.010
	6	3/16	172	.010

Tolerances for dimensions A = $\pm 1/32$ inch.

3.24 **Type XIV, slitting files.** Slitting files shall be similar to figure 13 and shall conform to the requirements shown in table XVIII for the cut and length specified (see 6.2). Files shall be of uniform width and thickness from heel to point. The included angle between sides at each edge shall be 17 to 19°. Each of the four sides shall be double cut; each of the two sharp edges shall be single cut. The file shall not show visible distortion when placed on a flat surface.



FIGURE 13. Type XIV, slitting.

3.25 **Type XV, square files.** Square files shall be similar to figure 14 and shall con-

form to the requirements shown in table XIX for the cut and length specified (see 6.2). Files shall taper in both dimensions (width and thickness), at least one-third of the length of the point so as to produce a pointed end. Files shall be double cut on all sides or double cut on three sides with one side uncut at the manufacturer's option. No portion of the tapered length shall extend outside of the projected area of the largest cross section of the file.



FIGURE 14. Type XV, square.

3.26 **Type XVI, three-square files.** Three-square files shall be similar to figure 15 and shall conform to the requirements shown in table XX for the cut and length specified (see 6.2). Files shall taper on all sides at least one-third of the length to the point so as to produce a pointed end. At any given point each side shall be of equal width, and be double cut with single cut edges. No portion of the tapered length shall extend outside of the projected area of the largest cross section of the file.

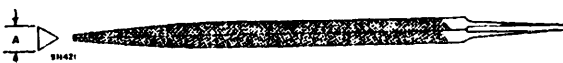


FIGURE 15. Type XVI, three-square.

TABLE XVIII. *Type XIV, slitting files*

Cut number	Length	Dimension A (width) $\pm 1/32$	Number of teeth per inch		Allowable warpage, maximum
			Sides	Edges	
	<i>Inches</i>	<i>Inch</i>			<i>Degrees</i>
0-----	4	7/16	58	58	2
	6	19/32	54	54	2
2-----	4	7/16	92	92	2
	6	19/32	84	84	2

TABLE XIX. *Type XV, square files*

Cut number	Length	Dimension at largest section A	Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
				Inch	Degrees
00-----	Inches	Inch			
	4	1/8	46	0.010	2
	6	3/16	42	.015	2
	8	1/4	38	.020	2
	10	11/32	32	.020	2
0-----	3	5/64	66	.010	2
	4	1/8	58	.010	2
	6	3/16	54	.015	2
	8	1/4	50	.020	2
	10	11/32	40	.020	2
1-----	4	1/8	72	.010	2
	6	3/16	66	.015	2
	8	1/4	62	.020	2
2-----	3	5/64	96	.010	2
	4	1/8	92	.010	2
	6	3/16	84	.015	2
	8	1/4	80	.020	2
	10	11/32	66	.020	2
4-----	3	5/64	146	.010	2
	4	1/8	130	.010	2
	6	3/16	120	.015	2

Tolerances for dimension A = $\pm 1/32$ inch.TABLE XX. *Type XVI, three-square files*

Cut number	Length	Dimensions at largest section A	Number of teeth per inch		Allowable warpage, maximum
			Sides	Edges	Degrees
00-----	Inches	Inch			
	4	1/4	46	66	2
	6	23/64	42	62	2
0-----	8	1/2	38	58	2
	3	5/32	66	86	2
	4	1/4	58	78	2
	6	23/64	54	74	2
	8	1/2	50	70	2
1-----	4	1/4	72	92	2
	6	23/64	66	86	2
	8	1/2	62	82	2
2-----	3	5/32	96	116	2
	4	1/4	92	112	2
	6	23/64	84	104	2
	8	1/2	80	100	2
4-----	3	5/32	146	146	2
	4	1/4	130	130	2
	6	23/64	120	120	2
	8	1/2	116	116	2

Tolerances for dimension A: Plus or minus 1/16 inch.

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TABLE XXI. Type XVII, warding files

Cut number	Length	Dimensions of largest section		Number of teeth per inch	Allowable distortion, maximum	Allowable warpage, maximum
		A	B			
	Inches	Inch	Inch		Inch	Degrees
00-----	3	3/8	3/64	56	0.004	4
	4	7/16	3/64	46	.005	4
	6	19/32	5/64	42	.008	4
	8	3/4	3/82	38	.010	4
0-----	3	3/8	3/64	66	.004	4
	4	7/16	3/64	58	.005	4
	6	19/32	5/64	54	.008	4
	8	3/4	3/82	50	.010	4
2-----	3	3/8	3/64	96	.004	4
	4	7/16	3/64	92	.005	4
	6	19/32	5/64	84	.008	4
	8	3/4	3/82	80	.010	4
4-----	4	7/16	3/64	130	.005	4
	6	19/32	5/64	120	.008	4

Tolerances for lengths 6 inches and shorter: Dim. A = $\pm 1/32$.
Dim. B = $\pm 1/64$.

Tolerances for lengths longer than 6 inches: Dim. A = $\pm 1/32$.
Dim. B = $\pm 1/32$.

3.27 Type XVII, warding files. Warding files shall be similar to figure 16 and shall conform to the requirements shown in table XXI for the cut and length specified (see 6.2). Files shall taper in thickness and width from heel to point with relatively sharp taper toward the point. Files shall be double cut on each side, and have two square edges with each edge single cut.



FIGURE 16. Type XVII, warding.

3.28 Type XVIII, needle files. Needle files shall be similar to figures 17 through 28, inclusive, and shall conform to the requirements shown in table XXII for the class, cut, and length specified (see 6.2). The tang end of the file shall be round in cross-sectional area and knurled (either diamond or straight) the full length, or intermittently knurled approximately one-half of the full length, for firm gripping.



FIGURE 17. Type XVIII, class 1, needle round.



FIGURE 18. Type XVIII, class 2, needle, half-round.

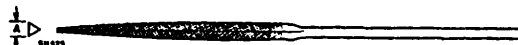


FIGURE 19. Type XVIII, class 3, needle, three-square.



FIGURE 20. Type XVIII, class 4, needle, crossing.



FIGURE 21. Type XVIII, class 5, needle, knife.



FIGURE 22. Type XVIII, class 6, needle, flat.



FIGURE 23. Type XVIII, class 7, needle, square.



FIGURE 24. Type XVIII, class 8, needle, barrette.



FIGURE 25. Type XVIII, class 9, needle joint, round-edge.

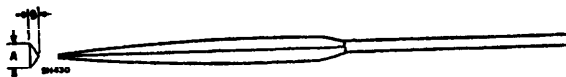


FIGURE 26. Type XVIII, class 10, needle, equaling.

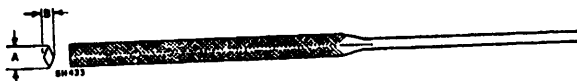


FIGURE 27. Type XVIII, class 1, needle, slitting.



FIGURE 28. Type XVIII, class 12, needle, marking, half-round.

TABLE XXII. Type XVIII, needle files

Cut number	Overall length $\pm 1/4$	Dimensions of largest section		Number of teeth per inch	Length of cut $\pm 1/4$
		A	$\pm 1/32$		

Class 1, round

Cut number	Inches	Inch, diameter	Number of teeth per inch	Inches
2-----	{ 4 5-1/2 6-1/4	{ 1/16 1/8 1/8	{ 105 90 80	{ 2-1/8 2-3/4 3-1/4
4-----	{ 4 5-1/2 6-1/4	{ 1/16 1/8 1/8	{ 135 120 120	{ 2-1/8 2-3/4 3-1/4
6-----	{ 4 5-1/2 6-1/4	{ 1/16 1/8 1/8	{ 170 160 160	{ 2-1/8 2-3/4 3-1/4

Cut number	Overall length $\pm 1/4$	Dimensions of largest section		Number of teeth per inch	Length of cut $\pm 1/4$
		A	B		
		$\pm 1/32$	$\pm 1/64$		

Class 2, half-round

Cut number	Inches	Inch	Inch	Number of teeth per inch	Inches
2-----	{ 4 5-1/2 6-1/4	{ 9/64 5/32 7/32	{ 3/64 1/16 1/16	{ 105 90 80	{ 2-1/8 2-3/4 3-1/4
4-----	{ 4 5-1/2 6-1/4	{ 9/64 5/32 7/32	{ 3/64 1/16 1/16	{ 135 120 120	{ 2-1/8 2-3/4 3-1/4
6-----	{ 4 5-1/2 6-1/4	{ 9/64 5/32 7/32	{ 3/64 1/16 1/16	{ 170 160 160	{ 2-1/8 2-3/4 3-1/4

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TABLE XXII. Type XVIII, needle files
(cont'd.)

Cut number	Overall length ± 1/4	Dimensions of largest section		Number of teeth per inch	Length of cut ±1/4
		A	B		
		±1/82	±1/64		

Class 3, three-square

	Inches	Inch	Inch		Inches
0-----	4	3/32	-----	90	2-1/8
	5-1/2	9/64	-----	74	2-3/4
	6-1/4	5/32	-----	64	3-1/4
2-----	4	3/32	-----	105	2-1/8
	5-1/2	9/64	-----	90	2-3/4
	6-1/4	5/32	-----	80	3-1/4
4-----	4	3/32	-----	135	2-1/8
	5-1/2	9/64	-----	120	2-3/4
	6-1/4	5/32	-----	120	3-1/4
6-----	4	3/32	-----	170	2-1/8
	5-1/2	9/64	-----	160	2-3/4
	6-1/4	5/32	-----	160	3-1/4

Class 4, crossing

0-----	14	7/64	3/64	90	2-1/8
	5-1/2	3/16	1/16	74	2-3/4
	6-1/4	13/64	5/64	64	3-1/4
2-----	14	7/64	3/64	105	2-1/8
	5-1/2	3/16	1/16	90	2-3/4
	6-1/4	13/64	5/64	80	3-1/4
4-----	14	7/64	3/64	135	2-1/8
	5-1/2	3/16	1/16	120	2-3/4
	6-1/4	13/64	5/64	120	3-1/4
6-----	14	7/64	3/64	170	2-1/8
	5-1/2	3/16	1/16	160	2-3/4
	6-1/4	13/64	5/64	160	3-1/4

Class 5, knife

0-----	4	9/64	1/16	90	2-1/8
	5-1/2	3/16	5/64	74	2-3/4
	6-1/4	1/4	3/32	64	3-1/4
2-----	4	9/64	1/16	105	2-1/8
	5-1/2	3/16	5/64	90	2-3/4
	6-1/4	1/4	3/32	80	3-1/4
4-----	4	9/64	1/16	135	2-1/8
	5-1/2	3/16	5/64	120	2-3/4
	6-1/4	1/4	3/32	120	3-1/4
6-----	4	9/64	1/16	170	2-1/8
	5-1/2	3/16	5/64	160	2-3/4
	6-1/4	1/4	3/32	160	3-1/4

TABLE XXII. Type XVIII, needle files
(cont'd.)

Cut number	Overall length ± 1/4	Dimensions of largest section		Number of teeth per inch	Length of cut ±1/4
		A	B		
		±1/32	±1/64		

Class 6, flat

	Inches	Inch	Inch		Inches
0-----	4	1/8	1/32	90	2-1/8
	5-1/2	3/16	3/64	74	2-3/4
	6-1/4	7/32	1/16	64	3-1/4
2-----	4	1/8	1/32	105	2-1/8
	5-1/2	3/16	3/64	90	2-3/4
	6-1/4	7/32	1/16	80	3-1/4
4-----	4	1/8	1/32	135	2-1/8
	5-1/2	3/16	3/64	120	2-3/4
	6-1/4	7/32	1/16	120	3-1/4
6-----	4	1/8	1/32	170	2-1/8
	5-1/2	3/16	3/64	160	2-3/4
	6-1/4	7/32	1/16	160	3-1/4

Class 7, square

0-----	4	1/16	-----	90	2-1/8
	5-1/2	3/32	-----	74	2-3/4
	6-1/4	7/64	-----	64	3-1/4
2-----	4	1/16	-----	105	2-1/8
	5-1/2	3/32	-----	90	2-3/4
	6-1/4	7/64	-----	80	3-1/4
4-----	4	1/16	-----	135	2-1/8
	5-1/2	3/32	-----	120	2-3/4
	6-1/4	7/64	-----	120	3-1/4
6-----	4	1/16	-----	170	2-1/8
	5-1/2	3/32	-----	160	2-3/4
	6-1/4	7/64	-----	160	3-1/4

Class 8, barrette

0-----	4	5/32	1/16	90	2-1/8
	5-1/2	7/32	1/16	74	2-3/4
	6-1/4	7/32	3/32	64	3-1/4
2-----	4	5/32	1/16	105	2-1/8
	5-1/2	7/32	1/16	90	2-3/4
	6-1/4	7/32	3/32	80	3-1/4
4-----	4	5/32	1/16	135	2-1/8
	5-1/2	7/32	1/16	120	2-3/4
	6-1/4	7/32	3/32	120	3-1/4
6-----	4	5/32	1/16	170	2-1/8
	5-1/2	7/32	1/16	160	2-3/4
	6-1/4	7/32	3/32	160	3-1/4

TABLE XXII. Type XVIII, needle files
(cont'd.)

Cut number	Overall length ± 1/4	Dimensions of largest section		Number of teeth per inch	Length of cut ±1/4
		A	B		
		±1/32	±1/64		
Class 9, joint, round-edge					
0-----	4	1/8	1/32	90	2-1/8
	5-1/2	7/32	1/16	74	2-3/4
	6-1/4	7/32	1/16	64	3-1/4
2-----	4	1/8	1/32	105	2-1/8
	5-1/2	7/32	1/16	90	2-3/4
	6-1/4	7/32	1/16	80	3-1/4
4-----	4	1/8	1/32	135	2-1/8
	5-1/2	7/32	1/16	120	2-3/4
	6-1/4	7/32	1/16	120	3-1/4
6-----	4	1/8	1/32	170	2-1/8
	5-1/2	7/32	1/16	160	2-3/4
	6-1/4	7/32	1/16	160	3-1/4
Class 10, equaling					
0-----	4	1/8	1/32	90	2-1/8
	5-1/2	7/32	3/64	74	2-3/4
	6-1/4	7/32	1/16	64	3-1/4
2-----	4	1/8	1/32	105	2-1/8
	5-1/2	7/32	3/64	90	2-3/4
	6-1/4	7/32	1/16	80	3-1/4
4-----	4	1/8	1/32	135	2-1/8
	5-1/2	7/32	3/64	120	2-3/4
	6-1/4	7/32	1/16	120	3-1/4
6-----	4	1/8	1/32	170	2-1/8
	5-1/2	7/32	3/64	160	2-3/4
	6-1/4	7/32	1/16	160	3-1/4

3.29 Type XX, diesinkers rifflers, regular files. Diesinkers rifflers, regular files shall be similar to figures 29 through 46, inclusive, and shall conform to the requirements shown in table XXIII for the class, cut, and length specified (see 6.2).

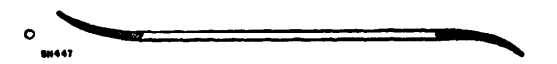


FIGURE 29. Type XX, class 1, diesinkers rifflers, regular files, No. 1.

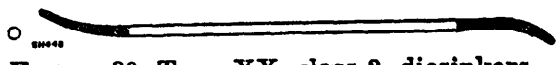


FIGURE 30. Type XX, class 2, diesinkers rifflers, regular files, No. 2.

TABLE XXII. Type XVIII, needle files
(cont'd.)

Cut number	Overall length ±1/4	Dimensions of largest section		Number of teeth per inch	Length of cut ±1/4
		A	B		
		± 1/32	±1/64		
Class 11, slitting					
0-----	4	5/32	1/16	90	2-1/8
	5-1/2	7/32	1/16	74	2-3/4
	6-1/4	1/4	5/64	64	3-1/4
2-----	4	5/32	1/16	105	2-1/8
	5-1/2	7/32	1/16	90	2-3/4
	6-1/4	1/4	5/64	80	3-1/4
4-----	4	5/32	1/16	135	2-1/8
	5-1/2	7/32	1/16	120	2-3/4
	6-1/4	1/4	5/64	120	3-1/4
6-----	4	5/32	1/16	170	2-1/8
	5-1/2	7/32	1/16	160	2-3/4
	6-1/4	1/4	5/64	160	3-1/4

Class 12, marking, half-round

0-----	4	9/64	3/64	90	2-1/8
	5-1/2	3/16	1/16	74	2-3/4
	6-1/4	7/32	1/16	64	3-1/4
2-----	4	9/64	3/64	105	2-1/8
	5-1/2	3/16	1/16	90	2-3/4
	6-1/4	7/32	1/16	80	3-1/4
4-----	4	9/64	3/64	135	2-1/8
	5-1/2	3/16	1/16	120	2-3/4
	6-1/4	7/32	1/16	120	3-1/4
6-----	4	9/64	3/64	170	2-1/8
	5-1/2	3/16	1/16	160	2-3/4
	6-1/4	7/32	1/16	160	3-1/4

¹ In 4-inch lengths, oval cross section shall be furnished in lieu of crossing.

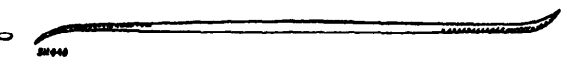


FIGURE 31 Type XX, class 3, diesinkers rifflers, regular files, No. 3.

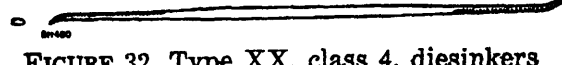


FIGURE 32. Type XX, class 4, diesinkers rifflers, regular files, No. 4.

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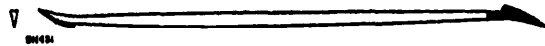


FIGURE 33. Type XX, class 5, diesinkers rifflers, regular files, No. 5.

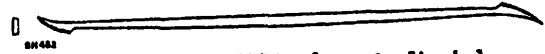


FIGURE 34. Type XX, class 6, diesinkers rifflers, regular files, No. 7.

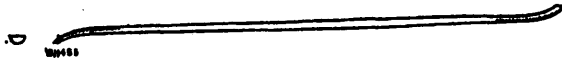


FIGURE 35. Type XX, class 7, diesinkers rifflers, regular files, No. 7.

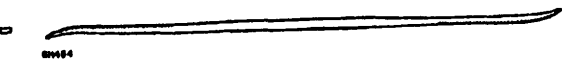


FIGURE 36. Type XX, class 8, diesinkers rifflers, regular files, No. 8.

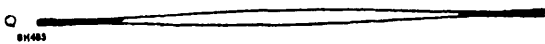


FIGURE 37. Type XX, class 9, diesinkers rifflers, regular files, No. 9.

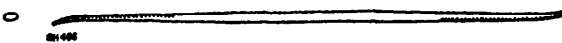


FIGURE 38. Type XX, class 10, diesinkers rifflers, regular files, No. 10.

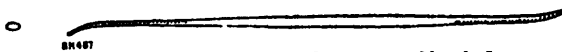


FIGURE 39. Type XX, class 11, diesinkers rifflers, regular files, No. 11.

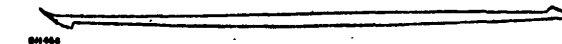


FIGURE 40. Type XX, class 12, diesinkers rifflers, regular files, No. 12.

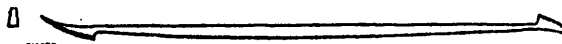


FIGURE 41. Type XX, class 13, diesinkers rifflers, regular files, No. 13.

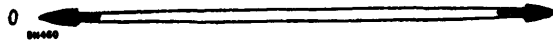


FIGURE 42. Type XX, class 14, diesinkers rifflers, regular files, No. 14.

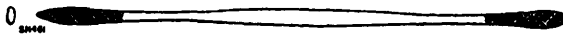


FIGURE 43. Type XX, class 15, diesinkers rifflers, regular files, No. 15.

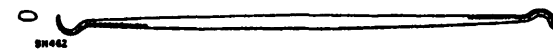


FIGURE 44. Type XX, class 16, diesinkers rifflers, regular files, No. 16.

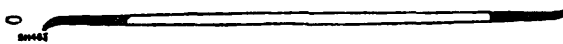


FIGURE 45. Type XX, class 17, diesinkers rifflers, regular files, No. 17.

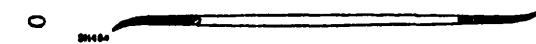


FIGURE 46. Type XX, class 18, diesinkers rifflers, regular files, No. 18.

TABLE XXIII. Type XX, diesinkers rifflers, regular files

Cut number	Length overall ±1/4	Number of teeth per inch	Length of cut ±3/16
Class 1, No. 1 shape			
	<i>Inches</i>		<i>Inches</i>
0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2
Class 2, No. 2 shape			
0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2
Class 3, No. 3 shape			
0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2
Class 4, No. 4 shape			
0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

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TABLE XXIII. Type XX, diesinkers rifflers, regular files (cont'd.)

Cut number	Length overall $\pm 1/4$	Number of teeth per inch	Length of cut $\pm 3/16$
------------	-----------------------------	-----------------------------	-----------------------------

Class 5, No. 5 shape

	Inches		Inches
0-----	6-1/2	64	11/16
2-----	6-1/2	80	11/16
4-----	6-1/2	108	11/16

Class 6, No. 6 shape

0-----	6-1/2	64	11/16
2-----	6-1/2	80	11/16
4-----	6-1/2	108	11/16

Class 7, No. 7 shape

0-----	6-1/2	64	1
2-----	6-1/2	80	1
4-----	6-1/2	108	1

Class 8, No. 8 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

Class 9, No. 9 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

Class 10, No. 10 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

Class 11, No. 11 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

3.30 Type XXI, screwhead files. Screwhead files shall be similar to figure 47 and shall conform to the requirements shown in table XXIV. Length with or without tang shall be as specified (see 6.2). Files shall be double cut on the sides of the 15° included angle.

TABLE XXIII. Type XX, diesinkers rifflers, regular files (cont'd.)

Cut number	Length overall $\pm 1/4$	Number of teeth per inch	Length of cut $\pm 3/16$
------------	-----------------------------	-----------------------------	-----------------------------

Class 12, No. 12 shape

	Inches		Inches
0-----	6-1/2	64	11/16
2-----	6-1/2	80	11/16
4-----	6-1/2	108	11/16

Class 13, No. 13 shape

0-----	6-1/2	64	11/16
2-----	6-1/2	80	11/16
4-----	6-1/2	108	11/16

Class 14, No. 14 shape

0-----	6-1/2	64	1
2-----	6-1/2	80	1
4-----	6-1/2	108	1

Class 15, No. 15 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

Class 16, No. 16 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

Class 17, No. 17 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

Class 18, No. 18 shape

0-----	6-1/2	64	1-1/2
2-----	6-1/2	80	1-1/2
4-----	6-1/2	108	1-1/2

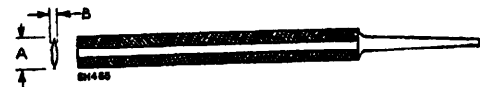


FIGURE 47. Type XXI, screwhead file.

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TABLE XXIV. Type XXI, screwhead files

Overall length		Number of teeth crossed per inch	Dimensions of section		Length of cut Inches 3
Class 1	Class 2		A	B	
With tang	Without tang		96 to 192	$\pm 1/16$	
Inches 4-1/2	Inches 3	Inch 7/16		Inch 1/32	

3.31 Type XXII, contact-point files. Contact-point files shall be similar to figure 48 and shall conform to the requirements shown in table XXV, as specified (see 6.2). Files shall be double cut on both sides with both edges uncut (safe). Length includes handle.



FIGURE 48. Type XXII, contact-point file.

TABLE XXV. Type XXII, contact-point files

Overall length	Number of teeth crossed per inch	Nominal dimensions of section		Length of cut (minimum) Inches
		A Inch	B Inch	
Inches 2-3/4	51 by 68	5/16	0.045	2-1/2

3.32 Workmanship. Workmanship of the files shall be of the quality prevailing among manufacturers normally producing Swiss pattern files of the type specified herein.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for

the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 that supplies and services conform to prescribed requirements.

4.2 Qualification¹. Qualification inspection shall be conducted at a laboratory satisfactory to the Bureau of Ships.

4.2.1 Qualification inspection. Qualification inspection shall consist of all the examinations and tests specified for quality conformance and the additional tests in 4.5.6 and 4.5.7.

4.2.2 Samples for qualification (all types). Samples for qualification of all types covered by this specification shall be submitted as follows, (also see 4.2.2.1):

One dozen, type VII, cut number 00, 12-inch files.
One of each type, class, cut number, and size files listed in table XXVI.

¹ Application for qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.3 and 6.3.1).

TABLE XXVI. Representative samples of Swiss pattern files required for qualification

Type	Description	Class (one each)	Cut number (one each)	Length, inches	Total number required
I	Barrette	-----	00, 0, 1, 2, 4	4	5
III	Crochet	-----	00, 0, 1, 2, 4	6	5
IV	Crossing	-----	00, 0, 1, 2, 3, 4, 6	6	7
V	Equaling	-----	00, 0, 1, 2, 4	4	5
VI	Half-round	-----	00, 0, 1, 2, 3, 4, 6	6	7
VII	Hand	-----	00, 0, 1, 2, 3, 4, 6	6	7
VIII	Joint	1, 2, 3, 4	0, 2	4	8
IX	Knife	-----	00, 0, 1, 2, 3, 4	6	6
XI	Pillar	1, 2, 3	00, 0, 1, 2, 3, 4, 6	4	21
XII	Pippin	-----	00, 0, 1, 2	6	4
XIII	Round	1	00, 0, 2, 4	5	4
		2	00, 0, 1, 2, 3, 4, 6	5	7
		2	8	2	1
XIV	Slitting	-----	00, 0, 2	6	3
XV	Square	-----	00, 0, 1, 2, 3, 4	6	6
XVI	Three-square	-----	00, 0, 1, 2, 3, 4	6	6
XVII	Warding	-----	00, 0, 1, 2, 4	6	5
XVIII	Needle	1 through 12	0, 2, 4, 6	5-1/2	48
XX	Diesinkers rifflers	1 through 18	2	6-1/2	18
		1	-----	4-1/2	1
XXI	Screwhead	2	-----	3-1/2	1
XXII	Contact-point	-----	-----	5-1/4	1

Notes:

1. When a representative length is not available, the next smaller or larger length should be submitted.
2. Only the types of files for which all of the representative classes, cut numbers, and sizes are submitted will be eligible for qualification.

4.2.2.1 *Samples for qualification of individual types.* When all types are not manufactured by a manufacturer, 2 each of the class, cut, and length, as listed in table XXVI for the applicable type for which qualification is requested, shall be furnished.

4.3 Sampling for quality conformance inspection.

4.3.1 *Lot.* All files of the same type, class, size, and cut numbers, presented at one time, shall be considered a lot for purposes of quality conformance inspection.

4.3.2 *Sample for quality conformance.* A random sample shall be selected from each lot in conformance with MIL-STD-105 at inspection level II.

4.4 *Quality conformance inspection.* Quality conformance inspection shall be performed on each sample file selected in accordance with 4.3.2. Quality conformance inspection shall consist of the following:

- (a) Examination (4.4.1).
- (b) Tests (4.5.1 through 4.5.5).
- (c) Inspections of preservation and packaging (4.6).

4.4.1 *Examination.* Each file selected in accordance with 4.3.2 shall be examined to determine compliance with the requirements of this specification. Examination shall be conducted in accordance with table XXVII, acceptable quality level (AQL) to be as indicated. Nonconforming files shall not be offered for delivery, and if the nonconforming files in any one sample exceed the acceptance number for that sample, the lot represented shall be rejected.

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TABLE XXVII. *Classification of defects in accordance with MIL-STD-105*

Categories	Defects
Critical:	
01	Lot not acceptable, not manufacturer's model designation as listed on Qualified Products List.
Major:	
101	AQL — 2.5 percent defective. Any characteristic not in accordance with specified requirements (type, class, cut number, not as specified).
102	Teeth malformed, missing, broken, or otherwise defective, affecting serviceability.
103	File length (cutting surface), not as specified.
104	Not double cut where specified.
105	Not single cut where specified.
106	Not safe where specified.
107	Not parallel as specified.
108	Tang not suitably formed or type specified.
Minor:	
201	AQL — 4.0 percent defective. Marking not as specified.

4.4.2 *Sample files.* Each of the sample files selected in accordance with 4.3.2, shall be tested in accordance with 4.5, to deter-

mine compliance with the requirements of this specification. AQL to be 1.5 percent defective. Any file failing in test shall not be offered for delivery, and if the nonconforming files in any one sample exceed the acceptance number for that sample, the lot represented by the sample shall be rejected. Quality conformance tests shall consist of the tests specified in 4.5.1 through 4.5.5.

4.5 Tests.

4.5.1 *Tang hardness.* Types I through XVII and type XXI, class 1, shall be tested for hardness limit in conformance with requirements of 3.7.

4.5.2 *Determination of distortion.* Each of the sample files shall be tested as follows: Distortion for which maximum numerical values are specified herein shall be measured by means of a dial surface gage and steel blocks supported on a master flat surface as shown on figure 49 or other similar manner. Flat blocks shall be employed for flat surface files and V-blocks for round, and

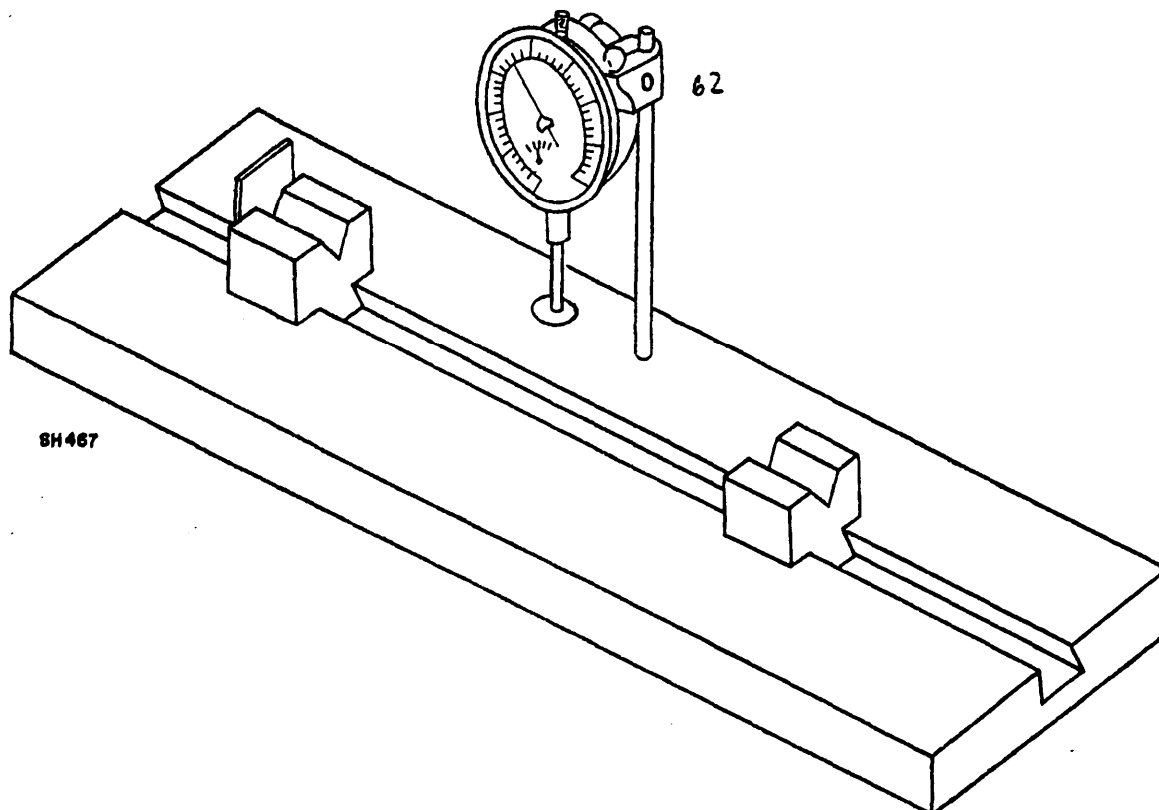


FIGURE 49. Distortion tester.

curved surface files. The flat or V-blocks shall be placed under the point, and the heel of the file under test and dial-gage readings shall be taken at the center on opposite sides by rotating the file through 180°. Minor fluctuations in the measurement, because of file teeth, shall be disregarded. The distortion shall be considered as a deviation from the centerline of the file from a straight line, and is one-half of the difference between the maximum and the minimum gage readings expressed in thousandths of an inch. Where the distortion requirement is specified in terms of the projected cross section at the largest dimensions, the file shall be applied to a flat surface, and observation made of the tapered section to determine conformance with the applicable requirement of distortion.

4.5.3 Measurement of warpage. Each of the sample files shall be tested as follows: Warpage for which maximum numerical values are specified shall be measured by means of an instrument consisting of one horizontal surface, and one pivoted surface, to which an indicating pointer is attached, supported on a master flat surface as shown on figure 50, or other similar manner. The horizontal surface shall be adjustable as to position to accommodate the length of file under test. The point of the file shall be pressed against the pivoted surface, and the heel of the file shall be pressed against the horizontal surface. The warpage shall be measured by a pointer on a scale graduated in degrees.

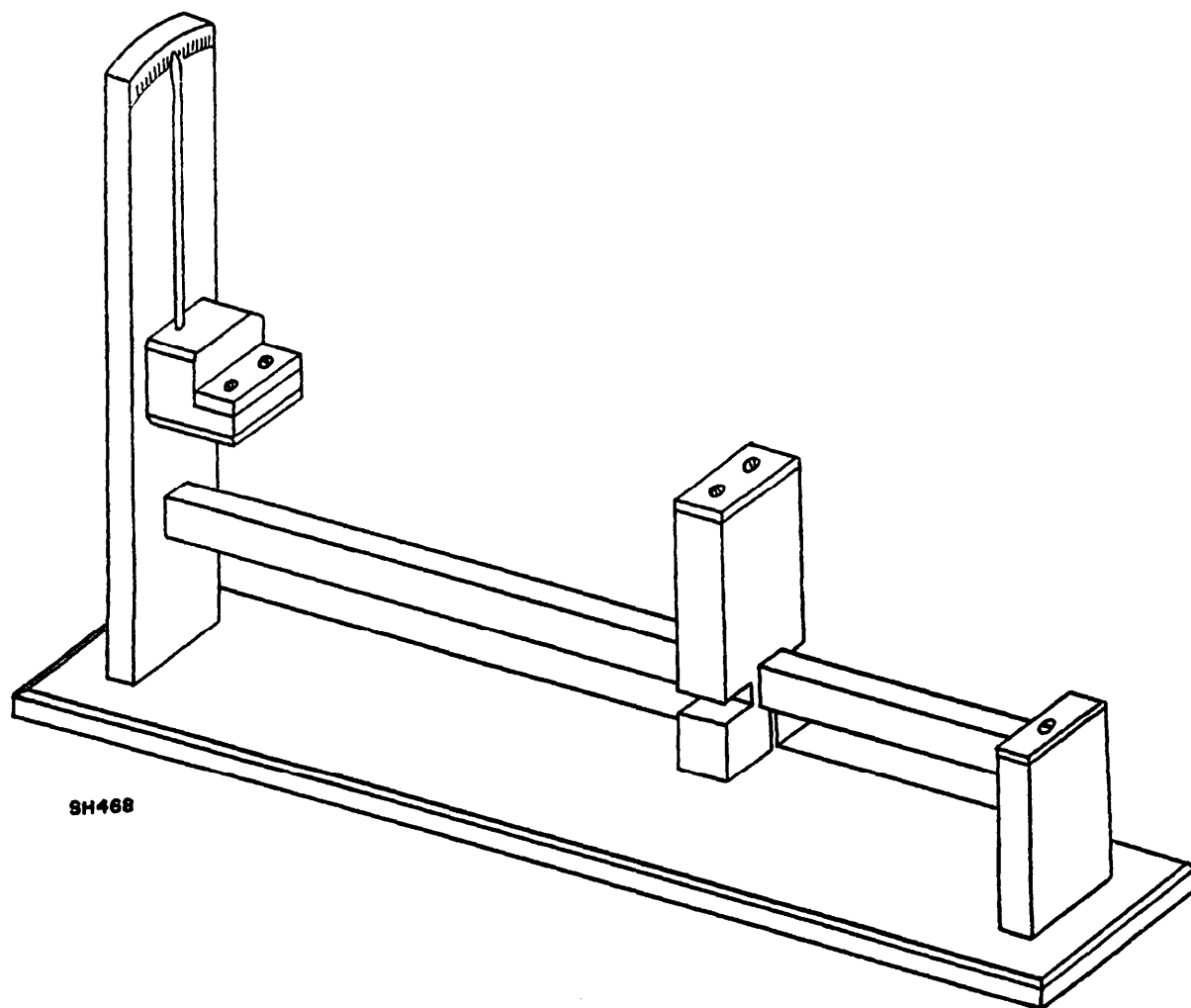


FIGURE 50. Warpage tester.

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4.5.4 Uniform cutting test. Each of the sample files shall be stroked with uniform pressure across the longitudinal surface of a 1/2-inch nominal diameter steel rod. At least one stroke shall be made with two opposite sides of round files and with each cut side and edge of other files. The teeth along the cutting path shall cut (bite) uniformly, and there shall be no indication that tops of the teeth are of unequal height. For this purpose, the 1/2-inch rod shall be of steel No. FS 1020 of QQ-S-634, or its approximate equal, and in an "as-cold-finished condition".

4.5.5 Test for hardening cracks. Each of the sample files shall be tested as follows: The point or tang of the file shall be held lightly (not gripped), and struck at least one medium light blow with the heel, or point of the file upon an unhardened steel block having a weight of at least 10 times that of the file. No fracture shall occur, nor shall there be any indication of a crack as evidenced by a deadened tone of the file when struck upon the steel block.

4.5.6 Hand prover test. Each of the sample files shall be placed upon a wooden-top bench or other similar location. The hand prover used for this test shall be approximately 1/8-inch thick by 1-inch wide, and 6 or 8 inches long, and shall be of file steel having a hardness of not less than the minimum shown in table XXVIII for the applicable file. One end of the prover shall have a beveled surface with a finish and shape similar to the coarseness and shape of the file to be tested. Care shall be taken to maintain these conditions of shape and beveled surface at all times. While the tang of a file is held down with one hand, the prover shall be held in the other hand with the beveled end of the prover placed near the point of the file. While holding the prover at an angle so that the beveled end corresponds to the surface of the file to be tested, it shall be drawn toward the heel of the file using a steady stroke of uniform pressure not to exceed the maximum allowed in ta-

ble XXIX. Each file of the sample shall perform satisfactorily in this test, that is, throughout the stroke of the prover, the file shall act upon the prover similar to the action obtained when using a light pressure in ordinary filing of unhardened steel. Any file which allows the prover to slide over any portion of its surface shall be rejected. Slide, as used in this instance, means absence of noticeable abrading, cutting, or filing action on the prover.

TABLE XXVIII. *Hardness of hand provers used in test of files*

Length of files	Type of files	Hardness of hand prover (minimum)
		Rockwell C.
Under 8 inches	Crossing; half-round; hand; pillar; round; square, and three-square.	58
8 inches and over	Crossing; half-round; hand; pillar; round; square; and three-square.	55
All lengths	Barrette; crochet; equaling; joint; knife; pippin; slitting; warding; needle; die-sinkers rifflers; screwhead; contact-point.	58

TABLE XXIX. *Pressure exerted on hand provers used in test of files*

Length of files	Shapes and sections of files	Pressure on hand prover (maximum)
		Pounds
Under 8 inches	Flat sides.	8
8 inches and over	Flat sides.	10
All lengths	Round; oval, and half-round.	6
All lengths	Contact-point, and edges of knife; slitting; needle; die-sinkers rifflers	4

4.5.7 Machine cutting tests of 12-inch, type VII, 00 cut files. Upon satisfactory completion of the tests for distortion and

warpage (see 4.5.2 and 4.5.3), machine cutting tests of 12-inch, type VII, cut number 00 hand files shall be conducted, using hacksaw machines adapted for file cutting tests. The files shall be clamped in the frame of the machine and operated for 20,000 strokes on each side of three files. The files shall cut 1 inch square, class 3, carbon tool steel (carbon 0.81 to 0.90 percent; manganese 0.15 to 0.35 percent). The steel shall be annealed, hardened, and drawn to a Rockwell hardness number of between C-24 and C-30. The file shall be operated at 60 strokes per minute under a pressure at midstroke of 30 pounds (see 3.3).

4.6 Inspection of preservation, packaging, packing, and marking for shipment and storage. Preservation, packaging, packing, and marking for shipment and storage shall be examined to determine conformance with the documents referenced in section 5, or as specified in the contract or order.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, and packing. Unless otherwise specified (see 6.2), preservation, packaging, and packing shall be in accordance with MIL-H-15424. Levels of preservation, packaging, and packing shall be as specified (see 6.2).

5.2 Marking.

5.2.1 Military agencies. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

5.2.2 Civil agencies. In addition to any special marking required by the contract or order, interior packages and shipping containers shall be marked in accordance with Fed. Std. No. 123.

6. NOTES

6.1 Intended use. The following is included as a general guide:

6.1.1 Barrette, crochet, crossing, equaling, half-round, hand, joint, pillar, pippin, round, slitting, and square files are finishing tools used by craftsmen for removing burrs, rounding out slots, cleaning out square corners, and smoothing finished parts for all kinds of intricate equipment. It should be kept in mind that the greater the number of teeth the smoother the resulting finish will be. The smaller points on some of these files make them especially useful for shaping and finishing very narrow grooves, slots, notches, keyways, and enlarging small holes.

6.1.2 Knife files are utilized by tool and diemakers on work having acute angles.

6.1.3 Three-square files are for filing internal angles, clearing out corners, and may be used for filing taps and cutters in the annealed condition.

6.1.4 Warding files are used by locksmiths for filing ward notches in keys and by other craftsmen for filing narrow slots in close spaces.

6.1.5 Needle files are primarily used by jewelers and diemakers, for delicate filing of intricate and plain shapes.

6.1.6 Diesinkers rifflers are generally used by tool and diemakers.

6.1.7 Screwhead files are primarily used on screwdriver slots in screwheads.

6.1.8 Contact-point files are primarily used by automobile and electronic mechanics for cleaning contact points (electrical).

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following data in procurement documents:

- (a) Title, number and date of this specification.
- (b) Type and class of file required (see 1.2).
- (c) Cut number and length required (see applicable table).

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- (d) Selection of applicable levels of preservation, packaging, and packing required (see 5.1).

6.3 With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in QPL GGG-F-331. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is the Bureau of Ships, Department of the Navy, Washington, D. C., 20360, and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.3.1).

6.3.1 Copies of "Provisions Governing Qualification" may be obtained upon application to Commanding Officer, Naval Supply Depot, 5801 Tabor Ave., Philadelphia, Pa., 19120.

6.4 This specification conforms to Simplified Practice Recommendation R206-63, insofar as is practicable.

6.5 Type X, metal saw, and type XIX, die-sinkers, classes 1 through 12 are obsolete and have been deleted from this specification.

6.6 Changes from previous issue. The extent of changes (deletions, additions, etc.) preclude the annotation of the individual changes from the previous issue of this document.

MILITARY CUSTODIANS:

Army—GL

Navy—SH

Air Force—69

Review Activity:

Navy—SH

User Activities:

Army—GL

Navy—MC, YD

Preparing Activity:

Navy—SH

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