Downloaded from http://www.everyspec.com

GGG-R-791f
April 5, 1967
SUPERSEDING
Int. Fed. Spec. GGG-R-00791e(GSA-FSS)
July 13, 1964 and
Fed. Spec. GGG-R-791d
January 7, 1959

FEDERAL SPECIFICATION

RULES, MEASURING

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 rules used for English, metric, or a combination of English and metric measurement.

1.1.1 Federal specification coverage. Federal specifications do not include all varieties of the commodity as indicated by the title of the specification, but are intended to cover only those generally used by the Federal Government.

1.2 Classification.

1.2.1 Types, classes, and styles. Rules covered by this specification shall be of the following types, classes and styles as applicable, as specified (see 6.1):

Type I—Caliper.

Type II—Carpenters' folding.

Type III—Multiple folding.

Class 1—Wood.

Style 1—Standard duty, inside reading.

Style 2—Standard duty, outside reading.

Style 3—Heavy duty, outside reading, with extension slide.

Class 2—Steel.

Class 3—Aluminum.

Type IV—Steel, machinists'.

Class 1—Rigid.

Class 2—Flexible.

Type V—(see 6.3).

Type VI—Glaziers.

Class 1—Plain cap.

Class 2—Hook cap.

Downloaded from http://www.everyspec.com

Type VII—Blacksmiths'.

Type VIII—Key seat.

Type IX—Hook.

Type X—Circumference.

Type XI—Shrinkage.

Type XII—Aluminum, one piece.

2. APPLICABLE DOCUMENTS

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

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 Illustrations. The illustrations shown herein are for the convenience of identification and are not intended to preclude the purchase of rules which are otherwise in accordance with this specification.

3.2 Graduation lines. Graduation lines shall be of a uniform and readily distinguishable width and shall be straight, permanent, and free from discontinuities and ragged edges. Graduation lines representing equal fractional aliquots of any scale, in descending order, shall be of equal height and readily distinguishable by the relative height from graduation lines representing other fractional aliquots.

3.3 Figures. Figures shall be clear, permanent, free from ragged edges and breaks, and shall appear in a distinctive manner so as to be readily legible under all service conditions. Figures and graduations shall resist easy removal by scraping. All rules, except types I and II, shall read from left to right. Types I and II rules shall read from right to left. When specified (see 6.1), type III rules shall read from right to left.

3.4 Marking. Each rule shall be marked in a plain and permanent manner with the manufacturer's name or with a trademark of such known character that the source of manufacture may be readily determined.

Downloaded from http://www.everyspec.com

3.5 Type I, caliper rule. One fold (leg) of the rule shall be grooved and provided with a substantial sliding, flush-fitting caliper made of brass.

3.5.1 Construction. The folds shall be of thoroughly seasoned, sound boxwood, unless maple, beech or birch is specified (see 6.1). The free ends of the end folds shall be bound with brass, securely fastened by means of rivets passing through the folds and binding members. The middle joint of the rule shall be either of the "square joint" or "arch joint" type, at the option of the contractor, and shall have two flanges (wings) for each fold covering the faces of the fold at the ends. The middle joint shall be brass and shall be secured to the ends of the folds with neatly headed rivets which pass through the folds and joint members. The width of the folds of any one rule shall be uniform.

3.5.2 Graduations and figures. The caliper slide shall have one face subdivided for at least 5 inches to sixteenths or thirty-seconds of an inch and the opposite face to thirty-seconds of an inch with both faces reading from right to left from inside caliper hook. The four edges of the rule shall be respectively subdivided to eighths, tenths, twelfths, and sixteenths of an inch, except that the eighth-inch graduations may be on the edge of only one fold, at the option of the contractor. The sixteenth-inch graduations shall be continuous over the joint. One corner of each graduated edge of each face shall be marked to show the smallest fractional subdivision to which it is graduated. All inch graduations shall be marked with the proper figures.

3.5.3 Accuracy. The scale error of any graduated edge shall not exceed plus or minus 1/64-inch between any two graduations, 3-inches apart including the total length of the graduated edge.

3.5.4 Finish. The wood folds shall have either a durable varnish or other protective coating suitable for preventing absorption of moisture. Calipers, end bindings, joints, and other bindings shall be of bright finished brass.

3.5.5 Type I rules shall conform to the requirements of table I and shall be similar to figure 1.

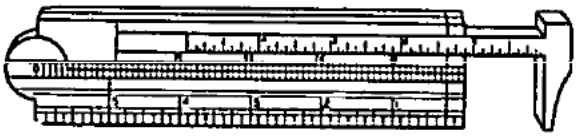

Figure 1. Type I, caliper rule.

Table I. Type I, caliper rule

Size	Number of folds	Joint location	Width folded ± 1/16 inch	Length unfolded (excluding head)	Graduated length of caliper slide (minimum)
			Inches	Inches	Inches
1-foot	2	6-in. division	1 3/8	12	5

3.6 Type II, carpenters' folding rules. Type II rules shall read from right to left.

3.6.1 Construction. The folds shall be of thoroughly seasoned, sound boxwood, unless maple, beech or birch is specified (see 6.1). The free ends of the end folds shall be bound with brass, securely fastened by means of rivets passing through the folds and binding members. The middle joint of the rule shall be either of the "square joint" or "arch joint" type, at the option of the contractor, and shall have two flanges (wings) for each fold covering the faces of the folds at the ends. Intermediate joints shall be of the "middle plate" type and shall have two plates for each fold, set flush with the top and bottom

Downloaded from http://www.everyspec.com

edge surfaces of the folds at the ends. The middle and intermediate joints shall be brass and shall be secured to the ends of the folds with neatly headed rivets or cut pins which shall pass through the folds and joint members. The width of the folds of any one rule shall be uniform.

3.6.2 Graduations.

3.6.2.1 Two-foot size. Unless otherwise specified (see 6.1), the 2-foot-size shall have the two edges of the rule respectively subdivided to eighths and sixteenths of an inch, one edge of one face subdivided to eighths of an inch and one edge of the opposite face subdivided to sixteenths of an inch. The subdivision on at least one edge of each face shall be continuous over all joints. All inch graduations, except on joints and terminal end, on one face shall be marked with the proper figures.

3.6.2.2 Three-foot size. The 3-foot-size rule shall have one edge of one face subdivided to eighths of an inch and one edge of the opposite face subdivided to sixteenths of an inch. The subdivisions shall be continuous on one face over all joints. All inch graduations except on joints and terminal end shall be marked with the proper figures.

Table II. Type II, carpenters' folding rule

Size	Number of folds	Joint location	Width folded ± 1/16 inch	Length unfolded
			Inch	Inches
2-foot	4	6-, 12-, and 18-inch divisions	1	24
3-foot	4	9-, 18-, and 27-inch divisions	1	36

3.6.3 Accuracy. The scale error of any graduated edge shall not exceed plus or minus 1/32 inch between any two graduations 3 inches apart including its total length of graduated edge.

3.6.4 Finish. The finish shall conform to the requirements of 3.5.4.

3.6.5 Carpenters' rules shall conform to the requirements shown in table II for the size specified (see 6.1) and shall be similar to figure 2.

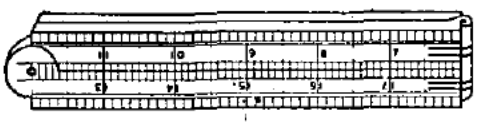

Figure 2. Type II, carpenters' folding rule.

3.7 Type III, multiple-folding rule. Type III rules shall be similar to figure 3.

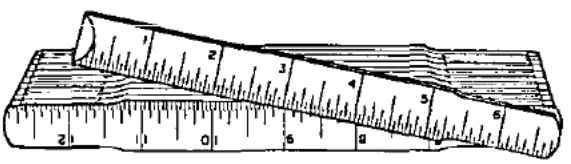

Figure 3. Type III, multiple-folding rule, class 1 wood, class 2 steel, and class 3 aluminum.

Downloaded from http://www.everyspec.com

3.7.1 Class 1, wood. Unless otherwise specified (see 6.1), class 1 rules shall be of 6-foot length, plus or minus 3/32 inch. The width of the rule shall be 5/8 ± 1/64 inch.

3.7.1.1 Construction. The rule shall be multiple folding, having joints with metal joint plates and durable spring tempered inner springs every 6 inches along its length between ends. Folds shall be of thoroughly seasoned, sound, hard maple beech or birch. The joints shall be of brass, phosphor bronze, copper-nickel-zinc alloy; or steel properly plated with brass, nickel, or similar material. The joints shall be securely fastened to the folds, and shall be constructed in such a manner to maintain the tolerance of accuracy specified in 3.7.1.3, when tested as specified in 4.4.2. When tested, as specified in 4.4.2, the rule shall hold rigid in the extended position when supported edgewise between the third and fourth joints from either end, and shall not stretch more than 1/16 inch from its original length when tested as specified in 4.4.2. The joints shall be permanently secured to the folds in such a manner that the folds will not loosen, weaken, or slip. The two extreme ends of the rule shall be provided with permanently secured tips of the same material as the joint plates, or aluminum arranged to prevent end-splitting and permit readability of end graduations. Each fold shall have two strike plates, one at each jointed end, arranged to prevent any contact between faces of adjacent folds, except that the first and last folds shall have a single strike plate at their joints. Strike plates shall be of the same material as the joint plates, except that brass strike plates may be furnished with plated steel joint plates, and shall be either independent members or part of the joint assembly. Unless otherwise specified (see 6.1), the rule shall be either with or without a folding end hook, at the option of the contractor. The end hook, if any, shall be of substantial construction with hinge rivet passing through the fold, and arranged so as to extend 3/8 inch from the edge when unfolded and have the zero reading at the inside of the hook.

3.7.1.2 Graduations.

3.7.1.2.1 Unless otherwise specified (see 6.1), subdivisions on each face of the rules shall be to sixteenths of an inch. Either one edge or both edges of each face shall be subdivided. At the option of the manufacturer, figures on each face shall read either consecutively in inches over the total length of the rule, or consecutively in inches through the first eleven inches with the remaining length reading consecutively in inches on one edge and feet and inches on the other edge. Figures on one face shall read in a direction opposite those on the other face. Figures shall be horizontal-reading, that is, the figures shall be upright when the rule is horizontal, unless vertical-reading figures are specified (see 6.1). Graduations and figures shall be impressed into the surface of the folds, visible to the naked eye.

3.7.1.2.2 If engineers' (surveyors' or roadbuilders') rules are specified (see 6.1), the rules shall be subdivided to hundredths of a foot on one face and to sixteenths of an inch on the opposite face, with each foot on each face marked to indicate the number of feet. Each tenth-foot graduation line of the hundredths-foot scale shall extend the full width of the rule and shall be marked to indicate to both feet and tenths of a foot, except that nine tenths of the first foot of the rule shall be marked to indicate tenths of a foot only and each numbered foot shall be followed by the letter "F." Each inch graduation line of the sixteenths-inch scale shall extend the full width of the rule and shall be marked to indicate both feet and inches, except that the first 11 inches of the rule shall be marked to indicate inches only and each numbered foot shall be followed by the letter "F."

3.7.1.2.3 Special graduations and figures. When specified (see 6.1), special graduations and figures, such as the combination metric and English or other subdivisions, shall be provided on the rule. The graduations and figures, of specially marked or subdivided rules shall be as specified in the contract or order.

3.7.1.3 Accuracy. The scale error of any graduated edge at any 2-foot interval (span) shall be not more than 1/32-inch.

3.7.1.4 Finish. The rules shall have a durable enamel or lacquer finish, and shall be either yellow or white. The ends of the folds, except under the metal end cap of the first and last fold shall be smooth and coated with a contrasting colored enamel or lacquer to preclude the absorption of moisture.

3.7.1.5 Style 1, standard duty, inside reading. The folds of style 1 rules shall be at least 0.095 inch in finished thickness, before enamelling or lacquering. The style 1 rule shall be of the inside reading type, that is, the numbering of figures shall commence on the inside of the folds.

Downloaded from http://www.everyspec.com

3.7.1.6 Style 2, standard duty, outside reading. The folds of style 2 rules shall be at least 0.095 inch in finished thickness, before enamelling or lacquering. The style 2 rule shall be of the outside reading type, that is, the numbering of figures shall commence on the outside of the folds.

3.7.1.7 Style 3, heavy duty, outside reading, with extension slide. The folds of style 3 rule shall be at least 0.120 inch in finished thickness, before enamelling or lacquering. The style 3 rule shall be of outside reading type, that is, the numbering of figures shall commence on the outside of the folds. The overall length of each joint shall be at least 1-½ inches. The joints shall be of brass, phosphor-bronze, copper-nickel-zinc alloy, or steel plated with brass, nickel or similar material. The rule shall be equipped with a brass, aluminum, or plated steel slide for taking inside measurements. The ends of the folds shall be square and shall terminate on the even inch marks. The slide shall be graduated and numbered for a distance of 6 inches, or more. The graduations shall be in 1/16-inch increments. The numbering shall be in inches. The slide shall run under friction. The slide shall travel 6 inches and stop(s) shall be provided to retain the slide in the first fold and to stop the slide in the closed and extended positions. A stud or button-type head approximately ⅛-inch in diameter by 1/16-inch high shall be provided, beyond the 6-inch number on the slide, to provide for adjustment of the slide by the operator's finger.

3.7.2 Class 2, steel. Class 2 rules shall be made from high-grade carbon steel, hardened and spring tempered. It shall be required that any 2-foot span of the rule be bent into a complete circle without showing any permanent set or damage to the joints.

3.7.2.1 Construction. The rules shall be multiple folding having joints every 6 inches along their length between ends. The joints shall be formed by means of a ⅛-inch diameter rivet joining the ends of two sections and fitted at each end with a washer 1/64-inch thick with ¼-inch outside diameter. Joints shall lock into position by means of two drawn spots in each end of each section except ends, drawn in such manner as to form a lug on one side of the section and a matching recess on the other side. When sections are aligned, the lugs on one section shall fit snugly into the recesses in the other section, thereby holding the rule in rigid alignment.

3.7.2.2 Sizes. As specified (see 6.1) the rule lengths shall be 3-foot ± 1/64 inch or 6-foot ± 1/32 inch. The rule width shall be ¾ ± 1/32 inch and the thickness shall be 1/32 inch ± 10 percent.

3.7.2.3 Graduations and figures. Graduation lines shall be of uniform width. Graduations and figures shall be machine cut or acid etched after machine dividing to a depth of 0.003 ± 0.001 inch. One edge of both faces of the rules shall be subdivided into sixteenths of an inch. Inch graduation lines shall extend fully to both edges and figures shall read consecutively, in inches, over the total length of the rule, from left to right, on both faces. Opposite faces shall be numbered from opposite ends. Figures shall be horizontal reading, that is, figures shall be upright when rule is in horizontal position.

3.7.2.4 Accuracy. The scale error in any 1 inch interval shall not exceed 0.006 inch and in any 3-foot interval shall not exceed 1/32 inch.

3.7.2.5 Finish. The rules shall have a smooth natural ground surface, finished to minimize reflections, and shall be coated with an oil or grease compound suitable for prevention of corrosion.

3.7.3 Class 3, aluminum. Class 3 rules shall be made from high-grade aluminum alloy.

3.7.3.1 Construction. The rule shall be multiple folding, having joints every 6 inches along its length between ends. The joints shall be made of brass male and female plates securely fastened to the rule sections and joined by a corrosion-resistant rivet and washer. Joint plates shall mate in such manner as to hold the rule sections in alignment when open or closed. When specified (see 6.1), rules shall be fitted with a folding brass hook. The hook, shall be of substantial construction with a brass hinge rivet passing through the section and shall be arranged so as to extend ⅜-inch from the edge of the rule when opened. Zero reading shall be at inside of open hook.

3.7.3.2 Sizes. Rule lengths shall be 6-foot ± 1/16 inch. The rule width shall be 9/16 ± 1/16 inch and the thickness shall be 1/16 inch ± 10 percent.

3.7.3.3 Graduations and figures. Graduation lines shall be of uniform width and depth. Graduation lines and figures shall be filled with durable black material. One edge of both faces of the rules shall be subdivided to sixteenths of an inch. Figures on each face shall read consecutively in inches over the

Downloaded from http://www.everyspec.com

total length of the rule with figures of one face reading in the opposite direction from those on the opposite face. Figures shall be horizontal reading that is, figures shall be upright when rule is horizontal, unless vertical reading figures are specified (see 6.1), figures shall be either inside or outside reading, the numbering shall commence on either the inside or outside faces of the end sections. When specified (see 6.1), the rules shall be subdivided into one-hundredths of a foot on one face and to sixteenths of an inch on the opposite face. Each foot graduation on both faces shall be marked to indicate the number of feet. On the face graduated in one-hundredths of a foot the tenth foot graduations within each foot shall be numbered 1 to 9, inclusive, and on the face graduated in sixteenths of an inch, the inch graduations within each foot shall be numbered 1 to 11, inclusive.

3.7.3.4 Accuracy. The scale error in any 2-foot interval (span) shall be not more than 1/32 inch.

3.7.3.5 Finish. The surface finish shall be natural dull aluminum.

3.8 Type IV, steel rules.

3.8.1 Class 1, rigid. Class 1 rule graduations shall be machine cut or acid etched, after machine dividing and shall be graduated as specified herein for each class. The width of the graduations shall be uniform for each scale between 0.004 and 0.010 inch wide, and the width of the graduation shall be less than the space between graduations. The depth of all graduations and figures shall be from 0.002 to 0.005 inch and all the graduations shall extend to and be perpendicular to the edge. One corner of each graduated edge shall be marked to show the smallest subdivision to which it is graduated. Inch graduations shall be suitably marked. Unless otherwise specified (see 6.1), subdivisions shall be numbered as follows: Thirty-seconds of an inch shall be numbered every 4th division, 4, 8, 12, 16, 20, 24 and 28. Sixty-fourths of an inch shall be numbered every 8th division, 8, 16, 24, 32, 40, 48 and 56. Tenths, fiftieths and hundredths of an inch shall be numbered every 10th of an inch, 1, 2, 3, 4, 5, 6, 7, 8, and 9. Numbering shall not be required for eighths and sixteenths of an inch. Standard graduation combinations shall be used. As specified in 3.8.1.2 and 3.8.2.1, selections may be made for class 1 rules, and class 2 rules, from the standard graduations listed in table III.

TABLE III. Steel rule graduations

No.		
1	One face	One edge: 10ths, 20ths, 50ths, 100ths One edge: 12ths, 24ths, 48ths
	Other face	One edge: 16ths, 32nds, 64ths One edge: 14ths, 28ths
2	One face	One edge: 10ths, 20ths, 50ths, 100ths One edge: 12ths, 24ths, 48ths
	Other face	One edge: 16ths, 32nds, 64ths One edge: 8ths of an inch
3	One face	One edge: 32nds of an inch One edge: 64ths of an inch
	Other face	One edge: 10ths of an inch One edge: 50ths of an inch
4	One face	One edge: 32nds of an inch One edge: 64ths of an inch
	Other face	One edge: 8ths of an inch One edge: 16ths of an inch
5	One face	One edge: 32nds of an inch One edge: 64ths of an inch
	Other face	One edge: 10ths of an inch One edge: 100ths of an inch

Downloaded from http://www.everyspec.com

TABLE III. Steel rule graduations—(Cont'd.)

No.		
6-1	One face	One edge: 10ths of an inch One edge: 50ths of an inch
	Other face	Not graduated
6-2	One face	Both edges: 10ths of an inch
	Other face	Both edges: 50ths of an inch
7	One face	One edge: 32nds of an inch or One edge: 16ths of an inch One edge: 64ths of an inch One edge: 32nds of an inch
	Other face	One edge: 16ths of an inch One edge: 64ths of an inch One edge: 100ths of an inch One edge: 100ths of an inch
9	One face	One edge: 16ths of an inch One edge: 32nds of an inch
	Other face	One edge: 64ths of an inch One edge: Not graduated
10	One face	One edge: 32nds of an inch One edge: 64ths of an inch
	Other face	Not graduated
11	One face	One edge: 100ths of an inch One edge: 64ths of an inch
	Other face	Not graduated
12	One face	One edge: 50ths of an inch One edge: 100ths of an inch
	Other face	Not graduated
16	One face	One edge: 32nds of an inch One edge: 64ths of an inch
	Other face	One edge: 50ths of an inch One edge: 100ths of an inch
M-1	One face	One edge: Millimeters One edge: ½ millimeters
	Other face	Not graduated
M-2	One face	Both edges: Millimeters
	Other face	One edge: Millimeters One edge: ½ millimeters
ME-1	One face	One edge: ½ millimeters One edge: 64ths of an inch
	Other face	Not graduated
ME-2	One face	One edge: Millimeters One edge: 64ths of an inch
	Other face	One edge: ½ millimeters One edge: 32nds of an inch

Downloaded from http://www.everyspec.com

3.8.1.1 Construction. The rule shall be in one piece, without joints, shall be made of tool steel, and properly hardened, tempered, ground, and finished to minimize reflections. The opposite faces and the opposite longitudinal edge surface shall be ground parallel (see 3.8.1.3.2); the opposite transverse edge surfaces shall be similarly ground, at right angles to the faces and longitudinal edge surfaces. When specified (see 6.1), rules of stainless steel or chrome finish shall be furnished.

3.8.1.2 Graduations and figures. Unless otherwise specified (see 6.1), rules shall carry number 4 graduations specified in 3.8.1 and Table III. When specified, rules shall carry one of the following graduations:

Number 6-2:
6, 12, 18, 24, 36, and 48-inch lengths.

Number 7:
1, 2, 3, 4, 6, 9, 12, 18, 24, 36, and 48-inch lengths.

Number M-2:
5, 10, 15, 20, 30, 50, and 100 centimeter lengths.

Number ME-2:
5, 10, 15, 20, 30, 50, and 100 centimeter lengths.

3.8.1.3 Accuracy.

3.8.1.3.1 Tolerances. The overall length of rules 6 inches and under shall not vary by more than plus 0.004 or minus 0.002 inch; the overall length of rules 9- to 18-inch lengths, inclusive, shall not vary more than plus 0.005 or minus 0.002 inch; the overall length of rules 24- and 36-inch lengths shall not vary more than plus 0.006 and minus 0.003 inch; the overall length of 48-inch rules shall not vary more than plus 0.008 and minus 0.004 inch. The scale error from either end of the rule to the nearest ½ inch graduation shall not exceed plus or minus 0.002 inch. The scale error per foot or fraction thereof shall not exceed plus or minus 0.002 inch between any two graduations, nonaccumulative.

3.8.1.3.2 Parallelism. The out-of-parallel error of opposite edges shall not exceed 0.0024 inch. The out-of-parallel error of opposite faces shall not exceed 0.003 inch up to 18-inch lengths; rules over 18-inch length shall not exceed 0.002 inch per foot.

3.8.1.3.3 Squareness of ends. The out-of square error (90° angle between end and edge) shall not exceed plus or minus 5 minutes.

3.8.1.3.4 Straightness. The straightness of any edge for each 12 inches or fraction thereof shall not vary more than plus or minus 0.001 inch.

3.8.1.4 Finish. Unless otherwise specified (see 6.1), the rules shall have a smooth natural ground surface, finished to minimize reflections, and shall have a coating of an oil or grease compound suitable for preventing corrosion in storage without affecting the material coated. When chrome-plated rules are specified (see 6.1), a nonreflecting chrome finish shall be furnished with black filled graduations and figures.

3.8.1.5 Class 1 rules shall conform to the requirements shown in table IV for the length specified (see 6.1), and shall be similar to figure 4. When specified (see 6.1), class 1 rules shall be furnished with positive or sliding hook.

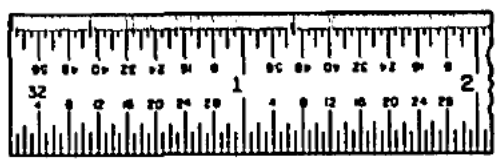

Figure 4. Type IV, steel rule; class 1, rigid class 2, flexible; type XI shrinkage; and type XII aluminum.

Downloaded from http://www.everyspec.com

TABLE IV. Type IV, class 1, steel, rigid

Length		Width		Thickness	
		Minimum	Maximum	Minimum	Maximum
Inches	Centimeters	Inches	Inches	Inch	Inch
1	--	0.450	0.510	0.040	0.051
2	5	.450	.510	.040	.051
3	--	.450	.565	.040	.051
4	10	.550	.625	.040	.051
6	15	.700	.760	.040	.051
9	20	.820	.880	.040	.051
12	30	.940	1.005	.040	.051
18	50	1.120	1.255	.040	.051
24	--	1.120	1.255	.040	.051
36	100	1.120	1.255	.040	.051
48	--	1.120	1.255	.040	.051

3.8.2 Class 2, flexible. Type IV, class 2 rules shall be the same as specified in 3.8.1.1, with the exception that the rule shall be fully flexible.

3.8.2.1 Graduations and figures. Unless otherwise specified (see 6.1), all rules shall carry number 10 graduations specified in 3.8.1 and table III. When specified, rules shall carry one of the following graduations:

Number:

3 ..... 6-inch length only
5 ..... 6-, 12-, 18-, 24- and 36-inch lengths
6-1 ..... 6-, 12-, 18-, 24- and 36-inch lengths
9 ..... 6-inch length only
11 ..... 6- and 12-inch lengths
12 ..... 6- and 12-inch lengths
M-1 ..... 10-, 15-, 20-, 30- and 50-centimeter lengths
ME-1 ..... 10-, 15-, 20-, 30- and 50 centimeter lengths

3.8.2.2 Accuracy. The requirements shall be as specified in 3.8.1.3. Class 2 rules shall conform to the requirements shown in table V for the length specified (see 6.1), and shall be similar to figure 4.

TABLE V. Type IV, class 2, steel rule, flexible

Length		Width		Thickness	
		Minimum	Maximum	Minimum	Maximum
Inches	Centimeters	Inch	Inch	Inch	Inch
1	--	0.450	0.500	0.010	0.016
2	--	.450	.500	.010	.016
3	--	.450	.500	.010	.016
4	10	.450	.500	.010	.016
6	15	.450	.500	.010	.016
9	20	.450	.500	.010	.016
12	30	.450	.500	.010	.016
18	50	.675	.750	.016	.021
24	--	.675	.750	.016	.021
36	--	.675	.750	.016	.021
48	--	.675	.750	.016	.021

Downloaded from http://www.everyspec.com

3.8.2.3 Finish. The finish shall be in accordance with 3.8.1.4.

3.9 Type VI, glaziers' rule.

3.9.1 Material. Rules shall be made of close-grained, thoroughly seasoned, sound wood.

3.9.2 Straightness. Rules shall be straight to the extent that neither warpage nor edge camber shall exceed 1/32 inch in any 1 foot nor 1/8 inch in any 6 feet, under normal atmospheric conditions.

3.9.3 Finish. Wood surfaces shall be smoothly and evenly machined and shall be sealed against moisture. Surfaces of brass caps shall be polished. Both wood and brass surfaces shall be coated with a transparent, abrasion- and moisture-resistant material.

3.9.4 Accuracy. When used under normal atmospheric conditions, the scale error shall not exceed 1/64 inch in any 2-foot interval, 1/32 inch in any 6 foot interval; or 3/64 inch in any 12 feet.

3.9.5 Class 1, plain cap.

3.9.5.1 Construction. Rules shall be constructed from one piece of wood fitted at each end with solid-brass caps. Caps shall be not less than 1/4-inch wide and rule ends shall be tenoned so that cap and rule surfaces are flush. Caps shall be attached by means of countersunk brass rivets.

3.9.5.2 Sizes. The rules shall conform to the dimensions shown in table VI for the size specified (see 6.1).

TABLE VI. Type VI, class 1, glaziers' rule, plain cap

Rule length	Length tolerance, plus or minus	Width, plus or minus 5 percent	Thickness, plus or minus 10 percent
Inches	Inch	Inches	Inch
36	1/64	2	1/4
48	1/32	2	1/4
60	1/32	2 1/2	1/4
72	1/32	2 1/2	1/4
84	3/64	3	1/4

3.9.5.3 Graduations. Graduation lines shall be of uniform width and depth and shall be filled with a durable black material. Both edges of one face and one edge of the opposite face shall be subdivided to eighths of an inch and shall be numbered in consecutive inches over the length of the rule. The remaining edge shall be subdivided to 1/4 foot and shall have each foot graduation numbered to indicate the number of feet. The 1/4 foot graduations, within each foot, shall be numbered 3, 6, and 9 to indicate inches. Rules shall read from left to right on both faces with figures on one face reading in opposite direction from those on opposite face.

3.9.5.4 Class 1 rules shall be similar to figure 5.

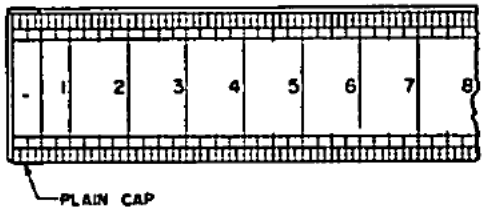

Figure 5. Type VI, class 1, glaziers' rule, plain cap.

Downloaded from http://www.everyspec.com

3.9.6 Class 2, hook cap.

3.9.6.1 Construction. The rules shall be made from one piece of wood, fitted on one end with a brass cap not less than ¼ inch wide, and at the other end with two brass plates, extending not less than 1¼ inches from the rule end. One of the plates shall carry a head extending in one direction to form a substantial hook that shall extend ⅜ inch from the face of the rule. The other plate (plain) shall be fitted to the face of the rule opposite the hook and the plates and rule joined by means of countersunk brass rivets. The rule ends shall be tenoned so that cap and plates are flush with the rule faces.

3.9.6.2 Sizes. The rules shall conform to the dimensions shown in table VII for the size specified (see 6.1).

3.9.6.3 Graduations. Graduation lines shall be of uniform width and depth and shall be filled with a durable black material. Both edges of both faces shall be subdivided to eighths of an inch and numbered consecutively in inches. Rules shall read from left to right with opposite face measuring in opposite directions. The inside, or hook, face shall have beginning of measurement (zero) at the capped end, reading (left to right) toward the hook. The outside face (opposite hook) shall have beginning of measurement (zero) opposite the inside of the hook, reading (left to right) away from the hook.

3.9.6.4 Class 2 rules shall be similar to figure 6.

TABLE VII. Type VI, class 2, glaziers' rule, hook cap

Rule length	Length tolerance, plus or minus	Width, plus or minus 5 percent	Thickness, plus or minus 10 percent
Inches	Inch	Inches	Inch
36	1/64	2	5/16
48	1/32	2	5/16
60	1/32	2½	⅜
72	1/32	2½	⅜
84	3/64	3	⅜
96	3/64	3	⅜
108	1/16	3	⅜
120	1/16	3	⅜
144	5/64	3	⅜

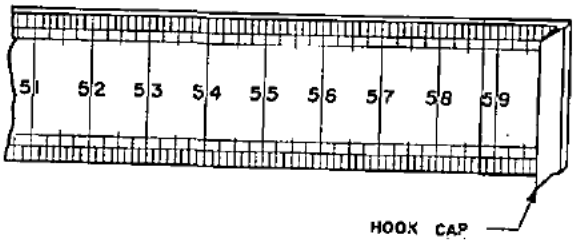

Figure 6. Type VI, class 2, glaziers' rule, hook cap.

3.10 Type VII, blacksmiths' rule. Type VII rules shall read from left to right.

3.10.1 Construction. The rule shall consist of two steel folds ¾ ± 1/16-inch wide, and 0.032 ± 0.005 inch thick. The two folds shall be riveted together to form, when opened, a 24-inch rule. The rule shall be the stop-joint type capable of holding the two folds in a straight line.

3.10.2 Graduations. Opposite sides of the rule shall read from the reverse ends. One side of the rule shall be graduated in sixteenths of an inch and the opposite side in eighths of an inch. The graduated lines and figures shall be sunken, black, and easy to read.

3.10.3 Accuracy. The scale error on either graduated edge shall not exceed plus or minus 1/64 inch between any two graduations, including its total length of graduated edge.

Downloaded from http://www.everyspec.com

3.10.4 Finish. The rules shall have a smooth natural surface, finished to minimize reflections, and shall be coated with oil or grease compound suitable for prevention of corrosion.

3.10.5 Type VII rules shall be similar to figure 7.

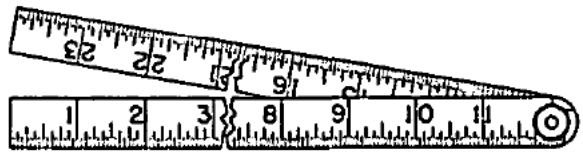

Figure 7. Type VII blacksmiths'.

3.11 Type VIII, key-seat rule.

3.11.1 Construction. Unless otherwise specified (see 6.1), the rules shall be of one-piece construction (without clamps) or two-piece construction (with clamps), at the option of the contractor. One-piece rules shall be made from a single piece of tool steel, shall represent a true right angle in section (measuring approximately 7/16- by 11/16-inch overall), and both outer edges shall be beveled and graduated in thirty-seconds of an inch. Two-piece rules shall consist essentially of one plain straightedge and one type IV, class 1 rigid steel rule (conforming to the requirements of 3.8.1 to 3.8.1.3.2, inclusive 3.8.1.3.4 and 3.8.1.1), and when specified (see 6.1), one graduated auxiliary straightedge. The plain straightedge shall be fitted with two clamps suitable for properly clamping either the steel rule or the auxiliary straightedge to form a box square. The clamps shall be provided with suitable thumbscrews. The auxiliary straightedge, when furnished, shall be graduated in thirty-seconds and sixty-fourths of an inch, and all figures and graduations shall conform to the applicable requirements of 3.8.

3.11.2 Accuracy.

3.11.2.1 Lengths. The nominal overall length shall be either 6 or 9 inches as specified (see 6.1). If no overall length is specified, the 6-inch length shall be furnished. The overall length shall vary not more than plus 0.004 or minus 0.002 inch. The scale error taken at the half-inch graduation from each end shall not exceed a tolerance of plus or minus 0.002 inch. The scale error between two graduations shall not exceed plus or minus 0.002 inch, nonaccumulative.

3.11.2.2 Squareness of ends. The out-of-square error shall not exceed plus or minus 1 minute (either the 90° angle between end and edge of one-piece rules, or end and edge of any of the three straightedges on two piece rules, or the box square formed by clamping the plain straightedge to either of the two graduated straightedges).

3.11.2.3 Finish. Unless otherwise specified (see 6.1), key-seat rules shall have a smooth natural ground surface, finished to minimize reflections, and shall have an oil or grease coating suitable for preventing corrosion in storage without adversely affecting the material coated.

3.11.3 Type VIII rules shall be similar to figure 8.

Downloaded from http://www.everyspec.com

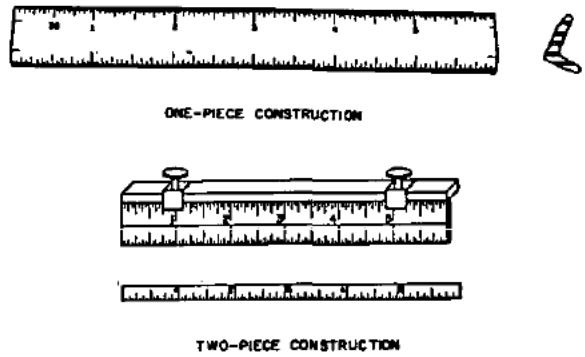

Figure 8. Type VIII, key-seat rule.

3.12 Type IX, hook rule (narrow). Type IX hook rule (narrow) shall be designed for taking measurements through holes and for setting calipers.

3.12.1 Construction. The rule shall be of tool steel, 3/16 inch wide by 3/64 inch thick plus or minus 10 percent, or when specified (see 6.1) 3/8 inch wide, by 3/64 inch thick, plus or minus 10 percent, properly hardened, and spring tempered, ground and finished to minimize reflection. Opposite faces and opposite longitudinal edges shall be ground parallel. Transverse edges, the end-surface of the hook, the inside edge of the hook stop, and longitudinal edges shall be at right angles to the faces. Overall length, including the hook, shall not exceed 6 5/32 inches.

3.12.2 Hook. The hook shall be either the fixed or sliding type as specified (see 6.1) and shall be of hardened steel attached to the end of the rule. Removable hooks shall be provided with an eccentric stud clamping device for locking hook in position. The hook shall extend beyond the graduated edge of the rule approximately 1/8 inch so as to provide a stop, the inside edge of which shall be flush with the end of the rule. The inside edge of the stop shall be beveled so as to provide a surface width not more than the thickness of the rule.

3.12.3 Graduation and figures. One edge of one face of the rule shall be machine-subdivided to thirty-seconds of an inch, and the same edge of the opposite face shall be machine-subdivided to sixty-fourths of an inch. Graduations shall be machine cut or acid etched. All inch graduations shall be marked with the proper figures which shall be arranged for reading the rule from the hook end. One corner of each face shall be permanently marked to show the smallest fractional subdivision to which it is graduated.

3.12.4 Accuracy.

3.12.4.1 Length. The length of the rule as measured from the inside edge of the hook shall be 6 inches, plus 0.004 inch or minus 0.002 inch. The scale error from either end of the rule to the nearest half-inch graduation shall not exceed a tolerance of plus or minus 0.002 inch. The scale error between any two graduations shall not exceed plus or minus 0.002 inch, nonaccumulative.

3.12.4.2 Parallelism. The out-of-parallel error of opposite faces and opposite edge surfaces shall not exceed 0.003 inch.

3.12.4.3 Squareness of ends. The out-of-square error (90° angle between end and edge) shall not exceed plus or minus 5 minutes.

3.12.4.4 Straightness. The straightness of any edge shall not vary more than 0.0005 inch.

3.12.5 Finish. Unless otherwise specified (see 6.1), the rule shall have a smooth natural ground surface, finished to minimize reflection, and shall have a coating of an oil or grease compound suitable for preventing corrosion in storage without affecting the material coated. When specified (see 6.1), a non-reflecting chrome finish shall be furnished with black filled graduations and figures.

Downloaded from http://www.everyspec.com

3.12.6 Type IX rules shall be similar to figure 9.

Figure 9. Type IX hook rule.

3.13 Type X, circumference rule. Type X circumference rules shall be made of high-grade carbon steel, hardened and spring tempered.

3.13.1 Construction. Rules shall be made from one piece of steel and shall have a ¼-inch hole centrally located in the first inch.

3.13.1.1 Sizes. As specified (see 6.1), rules shall be furnished in 3-foot or 4-foot lengths plus or minus 1/64 inch. The rule width shall be 1¼ ± 1/32 inch and the thickness shall be 1/16 inch ± 10 percent.

3.13.1.2 Graduations and markings. Graduation lines shall be of uniform width and graduations and markings shall be in accordance with 3.8.1. The top edge of the graduated face shall be subdivided to sixteenths of an inch and numbered in consecutive inches. The bottom edge of this face shall be subdivided to eighths of circumference inches and numbered in consecutive circumference inches. Figures on both edges shall read from left to right with beginning of measurement (zero) located at the end of the rule where hole is punched. The circumference, for any diameter, is read on the bottom edge opposite the diameter measurement on the top edge. The opposite face of the rule shall carry tables for laying out sheet metal measures for both liquid and dry measure and for laying out both flat top and pitched top cans. This face shall also carry cubic content data and mensuration formulas. All markings shall be etched to same depth as graduations and figures on measuring face.

3.13.1.3 Accuracy. The graduation error shall not exceed 0.006 inch in any 1 inch, 0.008 inch in any 1 foot, nor 0.012 inch in any 2 feet. The scale between any two graduations shall not exceed plus or minus 0.002 inch per foot, nonaccumulative.

3.13.1.4 Finish. The rules shall have a smooth natural ground surface, finished to minimize reflections, and shall be coated with an oil or grease compound suitable for prevention of corrosion.

3.13.1.5 Type X rules shall be similar to figure 10.

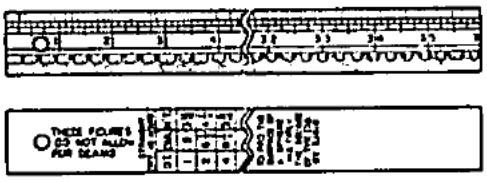

Figure 10. Type X circumference rule.

3.14 Type XI, shrinkage rule.

3.14.1 Construction. Construction shall conform to 3.8.1.1.

3.14.2 Graduations and figures. Unless otherwise specified (see 6.1), all rules shall carry No. 4 graduations specified in table III. When specified, rules shall carry No. 6-2 graduations specified in table III. Using either graduations, divisions shall be expanded and overall length extended to allow

Downloaded from http://www.everyspec.com

for shrinkage of hot metals as specified (see 6.1), shrinkage allowance for each 1 foot (12 inches) shall be 1/16, 1/12, 1/10, 3/32, 1/8, 9/64, 5/32, 3/16, 1/4, 5/16, 3/8, 7/16, or 1/2 inch as specified (see 6.1).

3.14.3 Accuracy. Accuracy shall conform to the requirements of 3.8.1.3 through 3.8.1.3.4.

3.14.4 Finish. Finish shall conform to 3.8.1.4.

3.14.5 Type XI shrinkage rules shall conform to the requirements shown in table VIII for length specified (see 6.1) and shall be similar to figure 4.

TABLE VIII. Type XI, shrinkage rule

Length	Width		Thickness	
	Minimum	Maximum	Minimum	Maximum
Inches	Inch	Inches	Inch	Inch
6	11/16	3/4	0.031	0.052
12	15/16	1	.041	.068
24	15/16	1 1/4	.041	.068

3.15 Type XII, one piece aluminum rules.

3.15.1 Construction. The rules shall be of one piece, without joints; shall be made of properly tempered aluminum finished to minimize reflection and shall have a 1/4 inch hole centrally located at one end. Graduations and figures shall be printed black, with a durable baking ink and the rules coated with clear, abrasion-resistant, baked clear lacquer.

3.15.2 Graduations and figures. Unless otherwise specified (see 6.1), rules shall be graduated on one side only with one edge reading in 16ths of an inch and the other edge in eighths of an inch. Each inch graduation shall be suitably numbered with the numbering of each edge starting at opposite ends of the rule. One corner of each graduated edge shall be marked to show the smallest subdivision to which it is graduated.

3.15.3 Accuracy. Error in graduation shall not exceed plus or minus 0.008 inch in 12 inches, or under; 1/64 in any 36 inches or 1/32 in 96 inches.

3.15.4 Parallelism. Out-of-parallel error of opposite edge shall not exceed 0.003 inch per foot.

3.15.5 Squareness of ends. The out-of-square error (90° angle between end and edge) shall not exceed 10 minutes.

3.15.6 Type XII rules shall conform to table IX for length specified and shall be similar to figure 4.

TABLE IX. Type XII, one piece, aluminum rules

Length	Width		Thickness	
	Minimum	Maximum	Minimum	Maximum
Inches	Inches	Inches	Inch	Inch
12	27/32	1 1/16	0.035	0.045
18	1 1/16	1 3/16	0.035	0.045
24	1 3/16	2 1/16	0.060	0.085
36	1 11/16	2 1/16	0.075	0.085
48	1 15/16	2 1/16	0.075	0.130
72	1 15/16	2 1/16	0.097	0.130
96	1 15/16	2 1/16	0.097	0.130

Downloaded from http://www.everyspec.com

3.16 Workmanship. Workmanship shall be first class throughout. Rules shall be free from defects which may affect their serviceability or durability. Steel rules and all steel component members of rules shall be free from rust.

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.

4.1.1 Inspection of materials and components. In accordance with 4.1, the supplier is responsible for insuring that materials and components used were manufactured, tested, and inspected in accordance with the requirements of referenced subsidiary specifications and standards to the extent specified herein, or, if none, in accordance with this specification.

4.2 Sampling procedures. Sampling procedures shall be in accordance with MIL-STD-105. Data for sampling shall be as stated in table X.

TABLE X. Sampling data

Category	Sample unit	Inspection level	Acceptable quality level	AQL expressed in terms of	Reference
Visual examination	1 ea.	I	2.5	Defects per hundred units	4.3.1
Dimensional examination	1 ea.	S-3	1.5	Defects per hundred units	4.3.2
Testing	1 ea.	S-4	1.5	Defects per hundred units	4.4
Preparation for delivery	One container	S-2	4.0	Defects per hundred units	4.5

4.3 Examination.

4.3.1 Visual examination. Each sample unit shall be examined for any non-conformance in design, material, finish, coating, construction, workmanship, and marking. Defects are listed in table XI.

TABLE XI. Classification of defects

Examine	Defect
Finish	Indication of corrosion.
	Not smooth, not clean, not free from burrs, slivers or other detrimental defects.
Material	Not fabricated from material specified.
Design	Not type, class, and style specified.
Construction and workmanship	Cracks, splits, deep pits, fractured, bent, warped, or crimped.
	Joints defective, not specified type or fail to lock in open positions.
	Loose rivets; rivets not furnished with washers.
	Joints stick, bind, or are excessively loose.
	Graduations or figures missing, illegible, not uniform, not readily distinguishable, not straight, discontinuities, ragged edges, or not graduated as specified.
	Different fractional aliquots not distinguishable by their relative height.
Marking	Missing, incorrect, not legible.

Downloaded from http://www.everyspec.com

4.3.2 Dimensional examination. Each sample unit shall be examined for any nonconformance with dimensional requirements.

4.4 Testing. Each sample unit shall be tested in accordance with 4.4.1, 4.4.2, 4.4.3.1, 4.4.3.2 and 4.4.3.3.

4.4.1 Scale accuracy (all types). Graduated scales for linear measurement shall be tested for compliance with the accuracy requirements specified for the individual type and class. These tests shall be made with suitable master rules, instruments, or laboratory apparatus of known accuracy. Tests for types IV, VII, IX, X, XI and XII metal rules shall be conducted at 68°F., measurements at other temperatures shall be adjusted to values corresponding to the standard temperature of 68°F. The error in any test measurement for accuracy shall not exceed the permissible accuracy error specified herein.

4.4.2 Durability of construction of folding joints (type III, class 1 rules). Each folding joint of each rule under test shall be swiveled through an arc of at least 90° (45° each side of the locking position of the joint) for 7,000 complete cycles. A complete cycle shall consist of a forward and backward movement through the locking position. The rule shall then be suspended from one end and a 5-pound weight attached to the other end for a period of 1 minute. After the above tests, the sample rule shall be inspected to determine conformance with the requirements of 3.7.1.1 and 3.7.1.3.

4.4.3 Parallelism, squareness of ends, and straightness (types IV, VIII, IX, XI and XII rules).

4.4.3.1 Parallelism. Types IV, VIII, IX, XI and XII rules shall be tested for compliance with the requirements for parallelism by means of a micrometer, or by a method of equal or greater precision.

4.4.3.2 Squareness of ends. Types IV, IX, XI and XII rules shall be tested for compliance with the requirements for squareness of ends by means of a precision surface plate and precision square and feelers or by a method of equal or greater precision.

4.4.3.3 Straightness. Types IV, VIII, IX, XI and XII rules shall be tested for compliance with the requirements for straightness by means of a precision surface plate and feelers, or by a method of equal or greater precision.

4.5 Inspection of preparation for delivery. An inspection shall be made to determine that the preservation, packaging, packing, and marking comply with the requirements of section 5. Defects shall be scored in accordance with table XII. The sample unit shall be one shipping container fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot.

TABLE XII. Classification of preparation for delivery defects

Examine	Defects
Markings (exterior and interior)	Omitted; incorrect; illegible; improper size, location, sequence, or method of application.
Materials	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, or distortion of container.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, and packing. Unless otherwise specified (see 6.1), the rules shall be preserved, packaged, and packed in accordance with MIL-H-15424. The levels of preservation and packaging shall be A or C and the level of packing, A, B, or C, as specified (see 6.1).

5.2 Marking.

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

5.2.2 Military activities. In addition to markings required by the contract or order, the interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

Downloaded from http://www.everyspec.com

6. NOTES

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

(a) Title, number, and date of this specification.
(b) Type, class, and style, as applicable, of rule required (see 1.2).
(c) Whether right to left reading rules are required (see 3.3).
(d) If maple, beech or birch is required for types I and II rules (see 3.5.1 and 3.6.1).
(e) If special graduations or other subdivisions or figures are required, combination decimal metric or English rules (see 3.6.2.1, 3.7.1.2.1, 3.7.1.2.3, 3.8.2.1, 3.14.2, and 3.15.2).
(f) If special length is required (see 3.7.1 and 3.7.2.2).
(g) If folding end hook is required (see 3.7.1.1 and 3.7.3.1).
(h) If vertical reading figures are required (see 3.7.1.2.1 and 3.7.3.3).
(i) If a specific style of numbering of figures is required (see 3.7.1.2, 3.7.3.3, 3.8.1, and table III).
(j) If engineers' (surveyors' or roadbuilders') rules are required (see 3.7.1.2.2).
(k) If special numbering for subdivisions is required (see 3.8.1).
(l) If stainless steel or chrome finish rule is required (see 3.8.1).
(m) Kind of special finish, if required (see 3.8.1.4, 3.11.2.3 and 3.12.5), or if chrome finish is required (see 3.8.1.4 and 3.12.5).
(n) Size required (see 3.7.2.2, 3.8.1.5, 3.8.2.2, 3.9.5.2, 3.9.6.2, 3.11.2.1, 3.13.1.1, 3.14.5, 3.15.6, and tables II and IV to IX, inclusive).
(o) If positive or sliding hook is required (see 3.8.1.5, and 3.12.2).
(p) If other than one- or two-piece construction is required (see 3.11.1).
(q) If auxiliary straight edge is required (see 3.11.1).
(r) If ⅝-inch width is required (see 3.12.1).
(s) Shrinkage allowance (see 3.14.2).
(t) Selection of applicable levels of preservation, packaging, and packing required (see 5.1).

6.2 For civil agency procurements. When level B packaging is required for civil agency procurements, the level A requirements in 5.1 shall apply.

6.3 Supersession data. The classification of rules covered in this specification, corresponding to those covered in GGG-R-791d, are as follows:

GGG-R-791d	GGG-R-791f
Type I—Caliper rule	Type I
Type II—Folding rule	------
Class 1—Carpenters'	Type II
Class 2—Blacksmiths'	Type VII
Type III—Multiple folding rule	Type III
Class 1—Wood	Class 1
Class 2—Metal	-------
Grade A—Steel	Class 2
Grade B—Aluminum	Class 3
Type IV—Steel rule	Type IV
Class 1—Regular	Class 1
Class 2—Key-seat	Type VIII
Class 3—Narrow hook	Type IX

Downloaded from http://www.everyspec.com

GGG–R–791d	GGG–R–791f
Class 4—Flexible	-------
Grade A—Machinists	Type IV, class 2
Grade B—Tinners'	Type X
Grade C—Map	(Deleted)
Class 5—Shrink	Type XI
Type V—Measuring tape	These tapes have been transferred to GGG–T–106.
Class 1—Butt-end case	
Class 2—Plain case	
Type VI—Glaziers' rule	Type VI
Class 1—Plain cap	Class 1
Class 2—Hook cap	Class 2

Military Custodians:
Army—GL
Navy—SH
Air Force—67

Review activity:
Navy—SH

User activities:
Army—GL
Navy—Mc, Yd
Air Force—67

Preparing activity:
GSA–FSS

U. S. Government Printing Office: 1967

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 15 cents each.

* U. S. GOVERNMENT PRINTING OFFICE : 1967 O - 252-501 (2)