QQ-S-681b

AMENDMENT—2
JULY 18, 1952

SUPERSEDING
Amendment—1
August 24, 1943

FEDERAL SPECIFICATION

STEEL; CASTINGS

This amendment, which forms a part of Federal Specification QQ-S-681, dated May 3, 1932, was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

Page 2, paragraph **C-1:** Delete paragraph and substitute:

C-1. Unless otherwise specified, steel for castings shall be made by one or more of the following processes: open hearth, electric furnace, converter, or crucible.

Page 6, table I: Second part, under "Physical properties (minimum)", delete the requirements for Classes 4B3, 4C2, and 4C3, and substitute:

TABLE I

Class	Tensile strength (pounds per sq. in.)	Yield point (pounds per sq. in.)	Elongation in 2 inches (percent)	Reduction of area (percent)	Cold bend
4B3	100,000	65,000	17	30	(7)
4C2	105,000	85,000	15	30	(7)
4C3	120,000	100,000	12	30	(7)

Table I: Add footnote reference number (7) to the heading of the last column, "Cold bend," and after footnote 6 under Table I add the following:

"7 The cold bend test shall be made only when specified on the drawing or in the inquiry or invitation for bids and contract or order."

Page 8, paragraph **H-1:** Delete and substitute as follows:

H-1. *Navy purchases.*—Navy purchases will be made under the issue in effect on date of invitation for bids of Military Specification MIL-S-15083, Steel; Castings, except that the Bureau of Yards and Docks will use this Federal specification in the purchase of the 4C2 castings covered thereby.

QQ-S-681b
AMENDMENT-1
AUGUST 24, 1943

FEDERAL STANDARD STOCK CATALOG

Section IV

(Part 5)

FEDERAL SPECIFICATION

FOR

STEEL; CASTINGS

This amendment was approved on the above date by the Director of Procurement, for the use of all departments and establishments of the Government, and shall become effective not later than November 1, 1943. It may be put into effect, however, at any earlier date after promulgation.

The following changes shall be made in Federal Specification QQ–S–681b, dated November 6, 1941:

Page QQ–S–681b—2:

Paragraph **C–1.** Delete paragraph and substitute:

C–1. Unless otherwise specified, steel for castings shall be made by one or more of the following processes: open hearth, electric furnace, converter, or crucible.

Page QQ–S–681b—6:

TABLE I. Second part, under "Physical properties (minimum)", delete the requirements for Classes 4B3, 4C2, and 4C3, and substitute:

TABLE I

Class	Tensile strength (pounds per sq. in.)	Yield point (pounds per sq. in.)	Elongation in 2 inches (percent)	Reduction of area (percent)	Cold bend [7]
4B3	100,000	65,000	17	30	(7)
4C2	105,000	85,000	15	30	(7)
4C3	120,000	100,000	12	30	(7)

Table I: Add footnote reference number (7) to the heading of the last column, "Cold bend," and after footnote 6 under Table I add the following:

"7 The cold bend test shall be made only when specified on the drawing or in the inquiry or invitation for bids and contract or order."

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QQ-S-681b

NOVEMBER 6, 1941

SUPERSEDING
Fed. Spec. QQ-S-681a
July 24, 1936

FEDERAL SPECIFICATION

STEEL; CASTINGS

This specification was approved on the above date by the Director of Procurement, for the use of all departments and establishments of the Government and shall become effective not later than April 15, 1942. It may be put into effect, however, at any earlier date after promulgation.

A. APPLICABLE SPECIFICATION.

A-1. The following Federal Specification, of the issue in effect on date of invitation for bids, shall form a part of this specification:

QQ-M-151.—Metals: General Specification for Inspection of.

B. CLASSES AND TYPES.

B-1. Steel castings shall be of the following classes and types, as specified in the invitation for bids:

Class X.—Common, no heat treatment, no physical tests.
Class 0.—Common, annealed,[1] no physical tests.
Class 1.—Soft, annealed,[1] tested.
Class 2.—Medium, annealed, normalized, or normalized and tempered; tested.
Class 3.—Hard, annealed,[1] tested.
Class 4.—To meet physical requirements, as follows:

4A1, 4A2} Annealed,[1] (see table I for requirements).

4B1, 4B2, 4B3} Either annealed, normalized, or normalized and tempered (see table I for requirements).

4C1, 4C2, 4C3, 4C4} Either annealed, normalized, normalized and tempered, or quenched and tempered (see table I for requirements).

[1] See par D-4b.

B–2. On drawings prepared prior to the issue of this specification, class 4 castings are shown without the subclass designations. In such cases, unless otherwise specified, class 4A2 shall be furnished.

C. MATERIAL AND WORKMANSHIP.

C–1. Unless otherwise required or approved by the design agency concerned, steel castings shall be made by one or more of the following processes: Electric (arc or induction) or open hearth.

C–2. All castings shall be of uniform quality and condition, free from injurious blowholes, porosity, hard spots, shrinkage defects, cracks, and other injurious defects.

D. GENERAL REQUIREMENTS.

D–1. The responsibility for furnishing castings that can be laid out and machined to the finished dimensions, within the tolerances given, without further straightening after final heat treatment, shall rest with the contractor, excepting that annealed castings of all classes may be hot straightened, without further heat treatment, by methods approved by the inspector. Castings of excessive size or weight shall not be furnished.

D–2. *Cleaning.*—Castings shall be well cleaned, with heads and gates removed. When specified in the contract or order (see paragraph I–1), this shall be done so that castings can be inspected in the "green"; excepting alloy steel castings which may be well cleaned and heads and gates removed for inspection after preliminary heat treatment. When heads and gates are removed by burning, this burning shall be done in such a manner as not to impair or materially change the general contour of the casting at the point or points where such heads or gates were attached to the casting. If necessary, grinding, cutting, or machining shall be done to assist in preserving the general contour and outline of the casting.

D–3. *Repair of defects by welding.*

D–3a. *Minor surface imperfections* not affecting the strength of castings may be welded in the "green" if approved by the inspector. Surface imperfections shall be considered minor when the depth of the cavity prepared for welding is not greater than 20 percent of the actual wall thickness, but in no case greater than 1 inch.

D–3b. *Defects other than minor surface imperfections* may be welded only when specifically authorized in accordance with the following provisions:

D–3b (1).—Permission for welding defects other than minor surface imperfections will be given only when the defects have been entirely removed and are judged not to affect the strength, use, or machinability of the castings, when properly welded and stress relieved.

D–3b (2). In granting permission to repair defects other than minor surface imperfections, the Government reserves the right for the purpose of examination to make any nondestructive test such as X-ray, Gamma-ray, or Magnaflux, whether required by the contract or not, to determine the full extent of the defects and the satisfactoriness of repairs.

D–3b (3). *Preheating.*—No casting shall be welded while the temperature of the casting is below 70° F.

D–3b (3)a. *Castings containing 0.35 to 0.45 percent carbon or over 0.90 percent manganese*, except class 1 or class 2 castings, shall be preheated to a temperature not to exceed 900° F., and the welding of defects shall be accomplished while the casting is maintained at a temperature above 300° F.

D–3b (4). *Castings containing over 0.45 percent carbon.* No welding of carbon or alloy steel castings with carbon in excess of 0.45 percent will be permitted without written approval of the purchaser. Requests for such approval shall be accompanied by a statement of the complete analyses of the castings. The brand of electrode or filler rod which it is proposed to use and a description of the technique which it is proposed to follow shall also be furnished.

D–3b (5). *Heat treatment after welding.*

D–3b (5)a. Wherever practicable, all repair by welding shall be done prior to final heat treatment.

D–3b (5)b. *Annealed Castings.*—When welding is done on annealed castings after final heat treatment, the castings, except carbon steel castings containing less than 0.30 percent carbon, shall be stress relieved at a temperature of 1000° to 1250° F. as required by the purchaser. When specified in the inquiry or invitation for bids and contract or purchase order, carbon steel castings containing less than 0.30 percent carbon, shall be stress-relief annealed after welding.

D–3b (5)c. *Normalized, normalized and tempered, and quenched and tempered castings.*— When welding is permitted on normalized, normalized and tempered, or quenched and tempered castings after final heat treatment, the castings shall be given such reheat-treatment as may be required by the purchaser.

D–3b (5)d. *Class X castings* shall be stress relieved after welding at a temperature of not less than 1000° F.

D–4. *Heat treatment.*

D–4a. All castings, except class X, shall be heat treated in a properly constructed furnace. Furnace temperature shall be accurately indicated by pyrometers. All castings that are to be heat treated in any manner shall have been allowed to cool after pouring, to a temperature below the critical range.

D–4b. *Annealed castings.*—Castings required to be annealed shall be heated to the proper temperature above the critical range and held at the treatment temperature for at least 1 hour per inch of thickness of the thickest section. Unless otherwise specified, castings weighing 1,500 pounds or less, except in the final heat treatment, may be cooled in still air if desired. Liquid quenching will not be permitted. All castings weighing more than 1,500 pounds shall be slowly cooled in the furnace from all heat-treating temperatures. However, the final heat treatment of all castings required to be annealed shall be slow cooling in the furnace from not less than 1,200° F. Cooling in air from 600° F. will be permitted.

D–4c. *Normalized or normalized and tempered castings.*—The procedure for normalizing shall consist of heating the castings to the proper temperature above the critical range, holding at that temperature for at least 1 hour per inch of thickness of the thickest section, and cooling in still air at room temperature. Normalized castings may be

tempered by heating to a temperature below the critical range but not less than 400° F. and then cooling either in the furnace or in still air at room temperature.

D–4d. *Quenched and tempered castings.*—The procedure for quenching shall consist of heating the castings to the proper temperature above the critical range, holding at that temperature for at least one hour per inch of thickness of the thickest section, and cooling rapidly by liquid quenching, liquid spraying, or air blasting. All castings which have been cooled by either of these methods shall be tempered by uniformly heating to a suitable temperature below the critical range but above 400° F., and then cooling.

D–5. Castings shall be well cleaned for final inspection by blasting, tumbling, or other approved process.

D–6. *Marking of castings.*—Except when otherwise specified or authorized by the purchaser, castings shall bear a pattern or mark number, together with the foundry's symbol, and all castings weighing more than fifty (50) pounds each shall bear the heat or melt number which may be stamped after casting and which shall be positively identified on bills of lading, certified reports, or manifests of shipment. If practicable all identification marks shall be so placed on the castings that they will not be machined off.

D–7. Pilot castings shall be furnished when specifically required by the contract or order. They shall be produced and inspected as detailed in purchase order. (See par. I–8.)

E. DETAIL REQUIREMENTS.

E–1. *Class X castings.*

E–1a. *Chemical requirements.*—As shown in table I.

E–1b. *Heat treatment.*—None required.

E–1c. *Repair by welding.*—Subject to provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (3), D–3b (5) (d) D–3b (2), and D–3b (3) (a).

E–1d. *Physical properties.*—No tests required.

E–2. *Class 0 castings.*

E–2a. *Chemical requirements.*—As shown in table I.

E–2b. *Heat treatment.*—Class 0 castings shall be annealed in accordance with paragraph D–4b.

E–2c. *Repair by welding.*—Subject to provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (3), D–3b (3) (a), D–3b (5) (b), D–3b (2), and D–3b (3) (a).

E–2d. *Physical properties.*—No tests required.

E–3. *Class 1 castings.*

E–3a. *Chemical requirements.*—As shown in table I.

E–3b. *Heat treatment.*—Class 1 castings shall be annealed in accordance with paragraph D–4b.

E–3c. *Repair by welding.*—Subject to provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (2), D–3b (3), D–3b (5) (a), and D–3b (5) (b).

E–3d. *Physical properties.*—As shown in table I.

E–4. *Class 2 castings.*

E–4a. *Chemical requirements.*—As shown in table I.

E–4b. *Heat treatment.*—Class 2 castings shall be annealed in accordance with paragraph D–4b, or normalized or normalized and tempered in accordance with paragraph D–4c. The contractor shall determine which of these heat treatments is to be used and shall inform the purchaser regarding the essential details of the treatment.

E–4c. *Repair by welding.*—Subject to provisions of paragraphs D–3a, D–3b, D–3b (1), D–3 (b) (2), D–3b (3), D–3b (5) (a), and either D–3b (5) (b) or D–3b (5) (c).

E–4d. *Physical properties.*—As shown in table I.

E–5. *Class 3 castings.*

E–5a. *Chemical requirements.*—As shown in table I.

E–5b. *Heat treatment.*—Class 3 castings shall be annealed in accordance with paragraph D–4b.

E–5c. *Repair by welding.*—Subject to provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (2), D–3b (3), D–3b (3) (a), D–3b (5) (a), and D–3b (5) (b), provided that paragraph D–3b (4) shall apply if the carbon content exceeds 0.45 percent.

E–5d. *Physical properties.*—As shown in table I.

E–6. *Class 4 castings.*—Unless otherwise specified the requirements shall be as indicated in the one of the following paragraphs which applies to the applicable subclass.

E–7. *Classes 4A1 and 4A2 castings.*

E–7a. *Chemical requirements.*—Phosphorus and sulphur shall not exceed the limits shown in table I.

E–7b. *Heat treatment.*—Class 4A1 and class 4A2 castings shall be annealed in accordance with paragraph D–4b.

E–7c. *Repair by welding.*—Subject to provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (2), D–3b (3), D–3b (3) (a), D–3b (5) (a), and D–3b (5) (b), provided that paragraph D–3b (4) shall apply if the carbon content exceeds 0.45 percent.

E–7d. *Physical properties.*—As shown in table I for the class specified.

E–8. *Classes 4B1, 4B2, and 4B3.*

E–8a. *Chemical requirements.*—Phosphorus and sulphur shall not exceed the limits shown in table I.

E–8b. *Heat treatment.*—Class 4B1, class 4B2, and class 4B3 shall be annealed in accordance with paragraph D–4b; or normalized, or normalized and tempered in accordance with paragraph D–4c. The contractor shall determine which of these heat treatments is to be used and shall inform the purchaser regarding the essential details of thetreatment.

E–8c. *Repair by welding.*—Subject to the provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (2), D–3b (3), D–3b (3) (a), D–3b (5) (a), and either D–3b (5) (b) or D–3b (5) (c), provided that paragraph D–3b (4) shall apply if the carbon content exceeds 0.45 percent.

E–8d. *Physical properties.*—As shown in table I for the class specified.

E–9. *Classes 4C1, 4C2, 4C3, and 4C4.*

E–9a. *Chemical requirements.*—Phosphorus and sulphur shall not exceed the limits shown in table I.

E–9b. *Heat treatment.*—Class 4C1, class 4C2, class 4C3, and class 4C4 shall be annealed in accordance with paragraph D–4b; or normalized or normalized and annealed in accordance with paragraph D–4c;

or quenched and tempered in accordance with paragraph D–4d. Any or all of these heat treatments may be performed one or more times at the option of the manufacturer who shall inform the purchaser regarding the essential details of the treatment.

E–9c. *Repair by welding.*—Subject to the provisions of paragraphs D–3a, D–3b, D–3b (1), D–3b (2), D–3b (3), D–3b (3) (a), D–3b (5) (a), and either D–3b (5) (b) or D–3b (5) (c), provided that paragraph D–3b (4) shall apply if the carbon content exceeds 0.45 percent.

E–9d. *Physical properties.*—As shown in table I for the class specified.

E–10. *Chemical analysis.*—An analysis of each melt shall be furnished by the contractor, showing the percentage of the elements specified and, in addition, any alloying elements intentionally added in amounts greater than two-tenths of 1 percent, and carbon and manganese in the case of those classes for which these elements are not specified.

E–11. *Special requirements*, as described in paragraph I–7, may be agreed upon between the purchaser and the contractor, in which case they will be specifically defined and designated in the inquiry or invitation for bids and the contract or purchase order.

TABLE I.—*Chemical and physical requirements*

Class	Chemical requirements (maximum limits)								Physical properties (minimum)				
	C	Mn	P	S	Si	Cu	Ni	Other elements (each)	Tensile strength (pounds per square inch)	Yield point (pounds per square inch)	Elongation in 2 inches (percent)	Reduction of area (percent)	Cold bend[8]
X	0.30	1.00	0.05	0.06					(1)	(1)	(1)	(1)	(1)
0	.45	1.00	.05	.06					(1)	(1)	(1)	(1)	(1)
1	[3].30	[3].60	.05	.06	0.60	0.30	[4]0.50	0.25	60,000	30,000	24	35	120
2	[5].35	[5].70	.05	.06	.60	.50	[4].50	.25	65,000	35,000	20	30	90
3	.50		.05	.06					80,000	40,000	17	25	(2)
4A1	(2)		.05	.06					75,000	40,000	24	35	(2)
4A2	(2)		.05	.06					85,000	53,000	22	35	(2)
4B1	(2)		.05	.06					85,000	55,000	22	40	(2)
4B2	(2)		.05	.06					90,000	60,000	22	45	(2)
4B3	(2)		.05	.06					100,000	65,000	18	30	(2)
4C1	(2)		.05	.06					90,000	65,000	20	45	(2)
4C2	(2)		.05	.06					105,000	85,000	18	40	(2)
4C3	(2)		.05	.06					120,000	100,000	14	35	(2)
4C4	(2)		.05	.06					150,000	125,000	10	25	(2)

[1] No physical tests required.
[2] Not required.
[3] In class 1 castings, for each reduction of 0.01-percent carbon under the maximum of 0.30 percent an increase of 0.04-percent manganese above 0.60 percent will be permitted, but in no case shall the manganese exceed 1 percent.
[4] For naval ordnance castings a maximum of 1-percent nickel is permitted.
[5] On class 2 castings for each reduction of 0.01-percent carbon from the maximum of 0.35 percent an increase of 0.025-percent manganese above 0.70 percent will be permitted.
[6] See par. I–6.

F. METHODS OF SAMPLING, INSPECTION, AND TESTS.

F–1. All castings shall be submitted and subjected to surface inspection by a Government inspector. Unless otherwise specified, inspection shall be made after final heat treatment. When specified in the contract or order, inspection shall be made in the "green"; except in the case of alloy-steel castings, which shall be inspected after preliminary heat treatment. (See paragraph I–1.)

F–2. All castings shall be surface inspected by a Government inspector after annealing or final heat treatment and cleaning. If cracks, defects, or unsoundness are indicated which may render the casting unfit for service, such castings shall be rejected subject to repair if authorized in accordance with applicable provisions of paragraph D–3.

F–3. *Test coupons.*

F–3a. Whenever practicable, coupons from which tension and bend-test specimens can be machined shall be cast on the body of all casting except class X and class 0. The number of coupons shall be sufficient and they shall be so located as to represent the character and thicknesses of the metal throughout the casting. The responsibility for furnishing sufficient test coupons shall rest with the contractor. Coupons shall not be detached from the casting until it has received its final heat treatment and until properly stamped and authorized by the inspector. The chilling of test coupons shall cause rejection of the material represented, except that coupons shall be treated in the same manner as the castings represented.

F–3b. When cast-on coupons are not practicable, sufficient coupons shall be cast with and gated to the castings, except class X and class 0, to represent the lot or the particular casting. When this is impracticable, the inspector may, upon request, permit: (a) Separate coupons to be cast from the same melt as the castings they represent; or (b) additional castings from the same melt or lot from which test specimens may be machined. In all cases separately cast coupons shall be identified by the Government inspector.

F–3c. When agreeable to the purchaser, test specimens may be taken from separately cast test bars or from test castings instead of from special coupons.

F–4. *Number of tests.*

F–4a. At least one tension test and, when bend tests are specified, one bend test shall be taken from each casting, except class X and class 0, the estimated weight of which is 1,000 pounds or more.

F–4b. Castings estimated to weigh less than 1,000 pounds each shall be grouped into lots for test. Each lot shall consist of castings made from the same melt and heat treated in the same furnace charge. At least two tension tests and, when bend tests are specified, one bend test shall be made from each lot consisting of over 1,000 pounds of castings. In case of lots consisting of 1,000 pounds or less of castings, at least one tension test and, when bend tests are specified, one bend test shall be made for each lot.

F–5. *Test specimens.*

F–5a. Tension test specimens shall conform to the dimensions of type 1 of Federal Specification QQ–M–151.

F–5b. Bend-test specimens shall be about 6 inches long and have a rectangular cross section 1 inch by ½ inch, with long edges rounded to a radius of not over 1/16 inch. The specimen shall be bent cold around a pin 1 inch in diameter to the angle specified in table I without cracking on the outside of the bent portion.

F–5c. When any test specimen shows defective machining or obvious lack of continuity of metal, it may be discarded and replaced by another specimen selected by the inspector. The nature of the flaw or lack of continuity of the metal, when deemed characteristic of the material under inspection, shall be taken into consideration when determining the acceptability of the material.

F–6. *Government chemical analyses* shall be made by the inspector, or through him, by a Government laboratory or other designated representative, and without cost to the contractor. The chemical composition thus determined shall conform to the requirements specified. Drillings for analysis shall be taken from broken test specimens or from a casting representing each melt. Castings shall be drilled in such a manner as not to impair their usefulness.

G. PACKAGING, PACKING, AND MARKING FOR SHIPMENT.

G–1. *Packing.*—Steel castings shall be so prepared for shipment as to insure acceptance by common or other carrier for safe transportation at the lowest rate to the point of delivery. If special packing be necessary for this purpose, such packing shall be provided by the contractor without additional expense to the Government.

G–2. *Marking.*—Shipments shall be marked with the name of the material, the grade, and the quantity contained therein as defined by the contract or purchase order under which shipment is made, the name of the contractor, and the number of the contract or purchase order.

H. REQUIREMENTS APPLICABLE TO INDIVIDUAL DEPARTMENTS.

H–1. For administrative reasons, Navy Department purchases will be made under the issue in effect on date of invitation for bids of Navy Department Specification 49S1, Steel Castings.

I. NOTES.

I–1. Invitations for bids or inquiries and contracts or purchase orders should state the class of steel castings required. See paragraphs I–7, I–8, and I–9 for other information that should be included in special cases. When it is necessary for castings to be inspected in the "green" such inspection should be specified in the invitation for bids or inquiry and the contract or purchase order. When the bend test is required, it should be specified on the drawing or in the inquiry or invitation for bids and the contract or purchase order.

I–2. Class X and Class 0 castings are intended for applications where structural strength is not of prime importance.

I–3. Class 1 castings are intended for fabrication by welding or welding to, in erection or service, when subsequent heat treatment is impracticable. They are intended for parts subject to severe vibratory stresses and shock.

I–4. Class 2 castings are intended for the same general purpose as class 1 castings, but where greater strength is desired. They are intended for welding, if stress relief annealed after welding.

I–5. Class 3 castings are intended for all important parts subject to crushing stresses or surface wear, such as hawse pipes, chain pipes, engine guides and slippers.

I–6. Class 4 castings are intended for use where physical properties are of prime importance and are usually made of alloy steel. The only chemical requirements specified in table I are maximum limits on phosphorus and sulphur. It is intended that ordinarily the content of carbon, manganese, silicon, and other alloying elements will be selected by the manufacturer to meet the physical properties specified.

I–7. *Special requirements.*—Invitations for bids or inquiries and contracts or purchase orders should so state when radiographic examination of the castings is required and the conditions under which such examination is to be made. Proposals and purchase orders for castings, in which soundness is essential, and about the soundness of which there can be any reasonable question, should require radiographic examination.

I–8. *Pilot castings.*—When pilot castings are considered necessary to insure obtaining satisfactory castings and to expedite deliveries, the conditions under which such pilot castings shall be furnished, inspected, and subjected to destruction tests, if necessary, for complete exploration, should be stated in the proposals and purchase orders.

I–9. *Patterns.*

I–9a. Attention is particularly invited to provisions or necessity for provisions with reference to patterns. Proposals and purchase orders for castings should specifically state whether the patterns are to be furnished by the Government or are to be supplied by the contractor.

I–9b. All patterns furnished by the Government should be properly cared for by the contractor and when being returned to the Government should be suitably boxed or crated by the contractor to prevent damage or breakage in transit. Before shipment from the foundry, patterns should be inspected by the Government inspector and report made by him if the patterns are found in an unsatisfactory condition.

I–10. Federal specifications do not include all types, classes, grades, sizes, etc., of the commodities indicated by the titles of the specifications, or which are commercially available, but are intended to cover the types, etc., which are suitable for Federal Government requirements

QQ-S-681b—10
(*Nov. 1941*)

Notice.—When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights, or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

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