

INCH-POUND

MIL-S-5059D
AMENDMENT 3
6 APRIL 1990
SUPERSEDING
AMENDMENT 2
29 NOVEMBER 1985

MILITARY SPECIFICATION
STEEL, CORROSION-RESISTANT (18-8),
PLATE, SHEET AND STRIP

This amendment forms a part of MIL-S-5059D, dated 30 May 1983, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 3

3.3, Delete in its entirety and substitute:

"3.3 Quality. The steel shall be aircraft quality. Sufficient discard shall be taken to ensure freedom from injurious pipping and undue segregation."

PAGE 4

3.6, Delete in its entirety and substitute:

"3.6 Sensitization. Types 304 and 316 shall be examined for sensitization in accordance with ASTM A 262, practice E (see 6.1.2 and 6.1.3). No evidence of intergranular attack shall be accepted."

PAGE 6

4.9, delete entirely.
4.9.1, delete entirely.
4.9.2, delete entirely.
4.9.3, delete entirely.

PAGE 7

Add "6.1.2 When type 316 is intended for use in nitric acid environments, corrosion testing per ASTM A262, practice C is recommended."

Add "6.1.3 Types 301 and 302 are susceptible to intergranular attack when used in a corrosive environment, and therefore should not be considered for use in those environments."

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Add * "6.5 Processing materials. Caution should be taken during any plating, cleaning, descaling, passivation, and similar processes. The contractor shall be responsible for the safe reutilization and disposal of all materials generated by these processes in accordance with the ASTM A 380 "Precautions" section paragraphs entitled, "Re-use of Cleaning and Pickling Solutions", and "Disposal of Used Solutions and Water".

PAGE 9

Table I: Delete and substitute attached TABLE I. TABLE I forms page 3 of this amendment.

Table II: Delete and substitute attached TABLE II. TABLE II forms page 3 of this amendment.

PAGE 10

Table III a: Delete and substitute attached Table IIIa. Table IIIa forms page 4 of this amendment.

Table III b: Delete and substitute attached Table IIIb. Table IIIb forms page 5 of this amendment.

PAGE 12

Table III c: Delete and substitute attached Table IIIc. Table IIIc forms page 6 of this amendment.

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

Custodians:
Army - AR
Navy - AS
Air Force - 11

Preparing Activity
Navy - AS
(Project 9515-0811)

Review Activities:
Army - EA, MI
Navy - OS
Air Force - 99, 84
DLA - IS

User Activities:
Army - ME

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Type	Conditions				
	Annealed	1/4 hard	1/2 hard	3/4 hard	Hard
301	X	X	X	X	X
302	X	X	X	X	* X
304	X	X	X	X	* X
316	X	X			

TABLE II. Chemical composition.

Type	Percent								
	C (max)	Mn (max)	P (max)	S (max)	Cr	Ni	Si (max)	Cu (max)	Mo
301	0.15	2.00	0.045	0.030	16.0-18.0	6.0-8.0	1.00	0.75	0.75 (max)
302	0.15	2.00	0.045	0.030	17.0-19.0	8.0-10.0	1.00	0.75	0.75 (max)
304	0.08	2.00	0.045	0.030	18.0-20.0	8.0-12.0	1.00	0.75	0.75 (max)
316	0.08	2.00	0.045	0.030	16.0-18.0	10.0-14.0	1.00	0.75	2.00- 3.00

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TABLE IIIa. Minimum tension test and hardness requirements.

Type (UNS)	Condition	Tensile strength (psi) 1/ (minimum)	Yield Strength (minimum)		Percent Elongation in 2 inches (minimum)			Hardness 2/ (minimum)	
			0.2 percent offset (psi)	Extension under load (inch in 2 inches)	Thickness up to 0.015 inch	Thickness 0.016 to 0.030 inch	Thickness 0.031 inch and over	Rockwell	BHN
301 (S30100)	Annealed	* 75,000/4	30,000	-	40	40	40	* B92 3/	194 3/
	1/4 hard	125,000	75,000	0.0098	25	25	25	C25	255
	1/2 hard	150,000	110,000	0.0125	15	18	18	C32	297
	3/4 hard	175,000	135,000	0.0144	10	12	12	C37	342
	Full hard	185,000	140,000	0.0148	8	9	9	C41	383
302 (S30200)	Annealed	75,000	30,000	-	40	40	40	* B92 3/	194 3/
	1/4 hard	125,000	75,000	0.0098	10	10	12	C25	255
	1/2 hard	150,000	110,000	0.0125	9	10	10	C32	297
	3/4 hard	175,000	135,000	0.0144	5	6	6	C37	342
	* Full hard	185,000	140,000	0.0148	2	2	2	C41	381
304 (S30400)	Annealed	75,000	30,000	-	40	40	40	* B92 3/	194 3/
	1/4 hard	125,000	75,000	0.0098	10	10	12	C25	255
	1/2 hard	150,000	110,000	0.0125	6	7	7	C32	297
	3/4 hard	175,000	135,000	0.0144	3	5	5	C37	342
	* Full hard	185,000	140,000	0.0148	3	5	5	C41	381
316 (S31600)	Annealed	75,000	30,000	-	40	40	40	* B95 3/	209 3/
	1/4 hard	125,000	75,000	0.0098	10	10	10	C25	255

NOTES:

- 1/ Maximum tensile strength for any condition shall not exceed the specified minimum by more than 25,000 psi.
 2/ Material shall not be rejected for low hardness provided that the tensile property requirements are met.
 3/ Maximum.
 * 4/ Maximum tensile strength requirement of note 1/ does not apply.

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TABLE IIIb. Free bend test requirements.

Type	Condition	Thickness 0.050 inch and under		Thickness over 0.050 through 0.187 inch		Thickness over 0.187 inch	
		Bend angle in degrees	Bend $\frac{1}{\text{factor}}$	Bend angle in degrees	Bend $\frac{1}{\text{factor}}$	Bend angle in degrees	Bend $\frac{1}{\text{factor}}$
301	Annealed	180	1	180	1	180	1
	1/4 hard	180	1	90	2	---	---
	1/2 hard	180	2	90	2	---	---
	3/4 hard	180	3	---	---	---	---
	Hard	180	4	---	---	---	---
302	Annealed	180	1	180	1	180	1
	1/4 hard	180	1	90	2	---	---
	1/2 hard	180	2	90	2	---	---
	3/4 hard	180	3	---	---	---	---
	* Hard	180	4	---	---	---	---
304	Annealed	180	1	180	1	180	1
	1/4 hard	180	1	90	2	---	---
	1/2 hard	180	2	90	2	---	---
	3/4 hard	180	3	---	---	---	---
	* Hard	180	4	---	---	---	---
316	Annealed	180	1	180	1	180	1
	1/4 hard	180	2	90	2	---	---

1/ Specimens shall be bent around a diameter equal to the product of the bend factor times the nominal thickness of the test specimen.

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Type	Condition	Thickness 0.050 inch and under		Thickness over 0.050 through 0.187 inch		Thickness over 0.187 inch	
		Bend angle in degrees	Bend 1/ factor	Bend angle in degrees	Bend 1/ factor	Bend angle in degrees	Bend 1/ factor
301	Annealed	135	1	135	1	135	1
	1/4 hard	135	2	135	3	---	---
	1/2 hard	135	4	135	4	---	---
	3/4 hard	135	6	---	---	---	---
	Hard	135	6	---	---	---	---
302	Annealed	135	1	135	1	135	1
	1/4 hard	135	2	135	3	---	---
	1/2 hard	135	4	135	4	---	---
	3/4 hard	135	6	---	---	---	---
	* Hard	135	6	---	---	---	---
304	Annealed	135	1	135	1	135	1
	1/4 hard	135	2	135	3	---	---
	1/2 hard	135	4	135	4	---	---
	3/4 hard	135	6	---	---	---	---
	* Hard	135	6	---	---	---	---
316	Annealed	135	1	135	1	135	1
	1/4 hard	135	5	135	6	---	---

1/ Specimens shall be bent around a diameter equal to the product of the bend factor times the nominal thickness of the test specimen.