

NOTICE OF
CHANGE

INCH-POUND

MIL-STD-777E(SH)
NOTICE 5
7 February 2002

MILITARY STANDARD

SCHEDULE OF PIPING, VALVES, FITTINGS, AND ASSOCIATED
PIPING COMPONENTS FOR NAVAL SURFACE SHIPS

TO ALL HOLDERS OF MIL-STD-777E(SH) :

1. THE FOLLOWING PAGES OF MIL-STD-777E(SH) HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
13	7 February 2002	13	31 January 2002
14	7 February 2002	14	31 January 2002
D-1.1	7 February 2002	D-1.1	13 November 1991
D-1.2	7 February 2002	D-1.2	13 November 1991
D-1.3	7 February 2002	NEW PAGE	
D-1.4	7 February 2002	NEW PAGE	
D-2.1	7 February 2002	D-2.1	13 November 1991
D-2.2	7 February 2002	D-2.2	13 November 1991
D-3.1	Delete	D-3.1	13 November 1991
D-3.2	Delete	D-3.2	13 November 1991
M-1.1	7 February 2002	M-1.1	13 November 1991
M-1.2	7 February 2002	NEW PAGE	

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-777E(SH) will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or canceled.

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<u>Category and group</u>	<u>Service</u>	<u>Date</u>
A-10	High pressure steam drains between low point trap discharge stop check valve and DFT/gland exhaust piping from turbines and discharge main, 100 psig, 425°F	February 7, 1986
B-1	Feed systems, 600 psig, 400°F; 1200 psig, 475°F	February 7, 1986
B-2	Propulsion plant saturated feed system, 600 to 2050 psig, 300°F	February 7, 1986
C-1 and C-2	Fresh water, including feed, chilled water, condensate, electronic fresh water cooling, potable, and gas turbine washdown, 200 psig, 250°F	Notice 4, 31 January 2002
D-1 and D-3	Sea water, including main and secondary drainage, ballast, 250 psig, 150°F	7 February 2002
D-2	Sea water missile injection system between fresh water accumulating tank and nozzles, main and secondary drainage, ballast and oily waste transfer, 400 psig, 150°F	7 February 2002
E-1	Fuel, 1200 psig	February 7, 1986
E-2	Fuel, 600 psig	February 7, 1986
E-3	Fuel, 200 psig	February 7, 1986
E-4	Fuel (gas turbine powered ships), 200 psig	February 7, 1986
F-1	Lubricating oil, 150 psig, 250°F	February 7, 1986
G-1	Steam catapult, hydraulic oil, 3000 psig, 150°F	February 7, 1986
G-2	Steam catapult, hydraulic oil, 200 psig, 150°F	February 7, 1986
G-3	Hydraulic oil - other than steam catapult, 3000 psig, 180°F	February 7, 1986
G-4	Hydraulic oil - other than steam catapult, 1500 psig, 180°F	February 7, 1986
G-5	Hydraulic oil - other than steam catapult, 900 psig, 180°F	February 7, 1986
G-6	Hydraulic oil - other than steam catapult, 300 psig, 180°F	February 7, 1986
G-7	Hydraulic oil - other than steam catapult, 150 psig, 150°F	February 7, 1986
H-1	Gasoline, 150 psig, 150°F	February 7, 1986
H-2	Cleaning fluid and contaminated aviation lubricating system, 100 psig, 150°F	February 7, 1986

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<u>Category and group</u>	<u>Service</u>	<u>Date</u>
I-1	JP-5 200 psig, 100°F	February 7, 1986
J-1	Air, nitrogen and helium, 6000 psig, 150°F	February 7, 1986
J-2	Air, nitrogen and helium, 3300 psig, 150°F	February 7, 1986
J-3	Air and nitrogen, 600 psig, 150°F	February 7, 1986
J-4	Air and nitrogen, 200 psig, 150°F	February 7, 1986
J-5	Air, aircraft, starting and cooling, bleed-off and 20.2 psi absolute systems, 150 psig, 550°F	February 7, 1986
J-6	Air, aircraft, starting and cooling, main system, 150 psig, 450°F	February 7, 1986
J-7	Air, Prairie-Masker, gas turbine starting sewage aerating, 100 psig, 600°F	February 7, 1986
J-8	Air, deballast, 50 psig, 400°F	February 7, 1986
J-9	Gas turbine bleed air system, 250 psig, 950°F	February 7, 1986
K-1	Gaseous oxygen, outside hull, 4500 psig, 150°F	February 7, 1986
K-2	Gaseous oxygen, inside hull, 4500 psig, ambient	February 7, 1986
K-3	Gaseous oxygen, 100 psig, ambient	February 7, 1986
K-4	Liquid oxygen and nitrogen, 6000 psig	February 7, 1986
K-5	Liquid oxygen and nitrogen, 250 psig	February 7, 1986
K-6	Mixed gas, 4500 psig, 150°F	February 7, 1986
K-7	Propane, 200 psig	February 7, 1986
L-1	Cooling (electronic equipment, diesel engine, and so forth) ethylene glycol, fresh water solution, distilled water transfer, 150 psig, 150°F	Notice 4, 31 January 2002
M-1	Sea water-washdown countermeasure system, 200 psig, 150°F	7 February 2002
N-1	Sprinkling system (dry) other than foam, 175 psig	February 7, 1986
N-2	Magazine sprinkling system (wet) 175 psig	February 7, 1986
O-1	Diesel, sewage treatment, incinerator and gas turbine exhaust, 1125°F	February 7, 1986
P-1	Boiler safety valve and super-heater outlet safety valve escape, 150 psig, 850°F	February 7, 1986
Q-1	Refrigerant piping, 30 inches vacuum to 300 psig, minus 85°F to plus 250°F	February 7, 1986

Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
D-1 and D-3	Sea water, including main and secondary drainage, ballast	250	150	

Item	Types	Material	Applicable documents	Remarks
Pipe	Seamless or welded	90-10 or 70-30 Copper-Nickel	MIL-T-16420	See notes D-1-3, D-1-4 and D-1-6
	Seamless	Glass Reinforced Plastic	MIL-P-24608	200 psig maximum See note D-1-2
Valves	Globe/angle stop and stop check, 2-1/2 NPS and above	Bronze	Drawing 803-1385541	Flanged ends only 100 psig max
	Globe, Y-pattern, 2-1/2 to 10 NPS		Drawing 803-1385623	Flanged ends only
	Globe/angle stop and stop check 1/4 to 2 NPS		Drawing 803-4384536	Union ends only
	Gate, 2-1/2 NPS and above		MIL-V-1189	Flanged ends only
			Drawing 803-2177917	
	Gate, 1/4 to 2 NPS		Drawing 803-1385714	Union ends only
	Swing check, 2-1/2 to 12 NPS		Drawing 803-1385637	Flanged ends only
	Swing check, 2-1/2 NPS and above	Bronze Nickel-Aluminum-Bronze	MIL-V-17547, type A, class 2, 250	
Swing check, 1/4 to 2 NPS	Bronze	Drawing 803-1385721	Union ends only	

SUPERSEDES PAGE D-1.1 OF NOTICE 2 TO MIL-STD-777E

D-1.1

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
D-1 and D-3, cont'd	Sea water, including main and secondary drainage, ballast	250	150	

Item	Types	Material	Applicable documents	Remarks
Valves cont'd	Relief	Bronze	MIL-V-24332	Flanged or union ends
	Remote control		MIL-V-15508	
	Pressure-reducing		ASTM F1370 including supplements	
	Check, diaphragm actuated		MIL-V-17501	Flanged ends
	Hose		Drawing 803-1385711	
			Drawing 803-1385712	
	Ball, 1/4 to 2-1/2 NPS	Bronze	Drawing 803-5001003	Bronze body with bronze, Ni-Cu, or Cu-Ni end piece
		Copper-Nickel		Cu-Ni body with Cu-Ni end piece
	Ball, 3 to 6 NPS	Bronze	Drawing 803-5001004	6 NPS valve is butt welded only
	Ball, 1-1/4 to 8 NPS		MIL-V-24509	
Butterfly	Nickel-Aluminum-Bronze	MIL-V-24624	Special flanges req'd 200 psig maximum	
Fittings	Silver-brazing	Bronze	MIL-F-1183	
	Butt welding	90-10 or 70-30 Copper-Nickel	Drawing 810-1385880	200 psig maximum
	Socket welding		Drawing 803-6397430	
	Welding base by silver-brazing end outlet boss	90-10 or 70-30 Copper-Nickel	Drawing 810-1385950	Welded to Copper-Nickel pipe run
	Socket bonded	Glass Reinforced Plastic	MIL-P-24608	200 psig maximum (see note D-1-2)
	Mechanically attached (MAFs)	Various	ASTM F1387	See 4.49

SUPERSEDES PAGE D-1.2 OF NOTICE 2 TO MIL-STD-777E

D-1.2

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
D-1 and D-3, cont'd	Sea water, including main and secondary drainage, ballast	250	150	

Item	Types	Material	Applicable documents	Remarks
Take-down joints	Silver-brazing flanges	Bronze	MIL-PRF-20042	
			Drawing 810-1385892	Special flanges for butterfly valves 200 psig maximum
	Socket bonded flanges	Glass Reinforced Plastic	MIL-P-24608	200 psig maximum (see note D-1-2)
	Butt welding flanges	Copper-Nickel	Drawing 810-1385992	200 psig maximum
	Socket welding flanges		Drawing 810-4715319	
	Slip-on flanges 12 NPS and above	90-10 Copper-Nickel	Commercial	50 psig max. See notes D-1-5 and D-1-7
	Silver-brazing unions	Bronze	MIL-F-1183	
	Union end tailpiece assy	Bronze Copper-Nickel	Drawing 803-7063850	For union end valves
Gaskets	Sheet	Synthetic rubber	MIL-R-21252, MIL-PRF-1149	See notes D-1-1 and D-1-6
		Non-asbestos	MIL-G-24696	Preferred gasket for butterfly valves
		Cloth, inserted rubber	HH-P-151	
	O-ring	Fluorocarbon	MIL-R-83248, type I, class 1	
Flange bolting	Bolts, studs and nuts	Nickel-Copper		See 4.15

D-1.3

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
D-1 and D-3, cont'd	Sea water, including main and secondary drainage, ballast	250	150	

NOTES:

- D-1-1 For use in piping systems subject to acid flush paths.
- D-1-2 Adhesive in accordance with MIL-P-24608 shall be used for joining GRP pipe to GRP fittings and flanges.
- D-1-3 For sizes not covered by MIL-T-16420, pipe fabricated from Copper-Nickel sheet specified in MIL-C-15726 may be used for pressures up to 50 psig.
- D-1-4 70-30 Copper-Nickel alloy shall be used inside compensated fuel tanks, and 90-10 alloy shall be used elsewhere.
- D-1-5 Slip-on flanges shall be bored to suit outside diameter of the tube with flange thickness, drilling, and facing in accordance with 50 psig class of MIL-PRF-20042.
- D-1-6 Gasket in accordance with MIL-PRF-1149 shall not be used for suction side of sea chest which uses steam for blow-out.
- D-1-7 Piping from discharge flange of fire pump to first flange of pump discharge check valve shall be 70-30 Copper-Nickel alloy.

D-1.4

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
D-2	Sea water missile injection system between fresh water accumulating tank and nozzles, main and secondary drainage, ballast and oily waste transfer	400	150	

Item	Types	Material	Applicable documents	Remarks
Pipe	Seamless or welded	70-30 Copper-Nickel	MIL-T-16420, class 700	
Valves	Gate, 2-1/2 NPS and above.	Bronze	MIL-V-1189 Drawing 803-2177917	Flanged ends only. 250 psig maximum
	Gate, 1/4 to 2 NPS.		Drawing 803-1385714	Union ends only
	Globe/angle stop, stop check and needle, 1/4 to 2 NPS		Drawing 803-4384536	Union ends only
	Globe, Y-pattern 2-1/2 to 10 NPS		Drawing 803-1385623	Flanged ends only See note D-2-1
	Globe/angle stop and stop check 2-1/2 NPS and above		Drawing 803-1385541	
	Relief		MIL-V-24332	
	Ball, 1/4 to 2-1/2 NPS		Bronze	Drawing 803-5001003
Copper-Nickel			Cu-Ni body with Cu-Ni end piece	
Diaphragm check		Bronze	MIL-V-17501	
Fittings	Silver-brazing	Bronze	MIL-F-1183	
	Butt welding	70-30 Copper-Nickel	MIL-F-24202	
	Mechanically attached (MAFs)	Various	ASTM F1387	See 4.49

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D-2.1

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
D-2, cont'd	Sea water missile injection system between fresh water accumulating tank and nozzles, main and secondary drainage, ballast and oily waste transfer	400	150	

Item	Types	Material	Applicable documents	Remarks
Take-down joints	Silver-brazing flanges	Bronze	MIL-PRF-20042	
	Butt and socket welding flanges	Copper-Nickel (70-30)	ASME B16.5, class 400	Flatface
	Silver-brazing unions	Bronze	MIL-F-1183	
	Union end tailpiece assy	Bronze Copper-Nickel	Drawing 803-7063850	For union end valves
Gaskets	Sheet	Synthetic rubber cloth	HH-P-151	250 psig max
		Synthetic rubber	MIL-PRF-1149	
Flange bolting	Bolts, studs and nuts	Nickel-Copper		See 4.15

NOTE:

D-2-1 100 psig maximum for drawing 803-1385541; 250 psig maximum for drawing 803-1385623. 2-1/2 NPS and above globe and angle, stop and stop check valves for use in systems exceeding these limits shall be of commercial design as approved by NAVSEA.

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D-2.2

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
M-1	Sea water-washdown countermeasure system	200	150	See note M-1-1

Item	Types	Material	Applicable documents	Remarks
Pipe	Seamless or welded	Copper-Nickel (90-10)	MIL-T-16420	
Valves	Gate 2-1/2 NPS and above.	Bronze	Drawing 803-2177917	Flanged ends only
	Gate, 1/4 to 2 NPS.		Drawing 803-1385714	Union ends only
	Globe/angle stop, stop check and needle 1/4 to 2 NPS		Drawing 803-4384536	Union ends only
	Control		MIL-V-17501	
	Ball, 1/4 to 2-1/2 NPS	Bronze	Drawing 803-5001003	Bronze Body with Bronze, Ni-Cu, or Cu-Ni end piece
				Copper-Nickel
	Ball, 3 to 6 NPS	Bronze	Drawing 803-5001004	6 NPS valve is butt welded only
Butterfly	Nickel-Aluminum-Bronze	MIL-V-24624	Special flanges req'd	
Fittings	Silver-brazing	Bronze	MIL-F-1183	
	Butt welding	Copper-Nickel alloy	Drawing 810-1385880	
	Socket welding		Drawing 803-6397430	
	Mechanically attached (MAFs)	Various	ASTM F1387	See 4.49
Take-down Joints	Flanges, silver brazing	Bronze	MIL-PRF-20042	
			Drawing 810-1385892	Special flanges for butterfly valves
	Union, silver-brazing		MIL-F-1183	
	Union end tailpiece assy	Bronze and Copper-Nickel Copper-Nickel	Drawing 803-7063850	For union end valves

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Category and group	Services	Maximum system pressure psig	Maximum system temperature °F	Remarks
M-1 cont'd	Sea water-washdown countermeasure system	200	150	See note M-1-1

Item	Types	Material	Applicable documents	Remarks
Take down joints cont'd	Socket welding flanges	Copper-Nickel alloy	Drawing 810-4715319	
	Butt welding flanges		Drawing 810-1385992	
Gaskets	Full face (flat)	Rubber	MIL-PRF-1149	Preferred gasket for butterfly valves
	Sheet	Non-asbestos	MIL-G-24696	
Flange bolting	Bolts, studs, Nuts	Nickel-Copper		See 4.15

NOTE:

- M-1-1 For attachment of type S corrosion-resisting steel spray heads a Nickel-Copper transition piece in accordance with MIL-T-1368, shall be welded to the head and silver-brazed to a bronze fitting in the piping system. Weld joint design shall be type P-14 of MIL-STD-22 except that the "T" dimension shall be the thickness of the welding socket wall.

M-1.2

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