



# Marine Submittal for Spears® Manufacturing Company EverTUFF® CPVC Schedule 40 & 80 Pressure Systems

MS4080-7-0423

Date: \_\_\_\_\_

Job Name: \_\_\_\_\_ Location: \_\_\_\_\_

Engineer: \_\_\_\_\_ Contractor: \_\_\_\_\_

**Scope:**

This submittal covers a CPVC Schedule 40 & 80 Pipe and 80 Fittings System for marine applications and consists of solid wall pipe in schedule 40 & 80, Schedule 80 fittings and a two-step primer / solvent cement joining process. This system is intended for use in non-essential areas of a vessel or accommodation space with applicable schedule pressure / temperature ratings; a complete system shall be supplied.

**Product Specification:**

Spears® EverTUFF® CPVC Schedule 40 and Schedule 80 marine pipe and Schedule 80 fittings shall be manufactured in the U.S.A. by Spears® Manufacturing Company from a Type IV, Grade I Chlorinated Polyvinyl Chloride (CPVC) compound with a Cell Classification of 23447 per ASTM D1784. The pipe and fittings shall be manufactured in strict compliance to ASTM F441 and ASTM F439 respectively consistently meeting the quality assurance test requirements of these standards. All Spears® marine pipe shall be provided with plain ends in 20 foot cut lengths and wrapped for protection. All Spears® EverTUFF® marine pipe and fittings shall be certified by NSF International for potable water applications and marked accordingly and available in Sizes ½" through 12". All EverTUFF® CPVC Schedule 40 & 80 marine pipe shall be approved by the United States Coast Guard, meet the low flame spread requirements and smoke and toxicity requirements of the IMO 2010 FTP Code Annex 1, Parts 2 and 5, and may be installed in accommodation, service, control without meeting the additional requirements of Title 46 CFR 56.60-25(a)(2) as manufactured by Spears® Manufacturing Company. All EverTUFF® CPVC Schedule 40 and Schedule 80 marine pipe and Schedule 80 fittings shall be approved by the American Bureau of Shipping (ABS) meeting IMO 2010 FTP Code Annex 1, Part 5 for Surface Flammability and Part 2 for Smoke & Toxicity and Transport Canada Approval Sections 114 & 226.

EverTUFF® CPVC marine schedule 80 pipe and solvent cement shall be GREENGUARD GOLD certified by Underwriters Laboratories (UL) with a Limited Lifetime Warranty as manufactured by Spears® Manufacturing Company.

**Product Marking:**

All pipe shall be marked EverTUFF® CPVC schedule 40 & 80 as applicable and shall be marked with NSF® Listing, applicable ASTM Standard, required ABS markings, U.S. Coast Guard Approval Number, testing laboratory file number and applicable pressure @ 73° F. (23° C). Pipe and solvent cement shall bear UL GREENGUARD GOLD marking. Schedule 80 fittings shall be engraved with NSF® Listing, applicable ASTM

Standard, bear a "USCG" mark for use in marine applications.

**Installation:**

Spears® EverTUFF® CPVC Schedule 40 & 80 marine pipe and schedule 80 fittings system is suitable for use on ships, marine vessels and accommodations in non-essential applications such as fresh water, sea water, potable water, and brine in services requiring no fire endurance testing or electrical conductivity testing. NOTE: EverTUFF® schedule 80 pipe & fittings in sizes ½" through 1-1/4" are suitable for use in vacuum flush sanitary piping, black & gray water systems, drains sanitary and vent applications. Spears® EverTUFF® CPVC Schedule 40 & 80 marine pipe and schedule 80 fittings may be installed in concealed spaces in accommodation, service, control spaces without meeting the additional requirements of Title 46 CFR 56.60-25(a)(2). Installation shall comply with the current installation instructions provided by Spears® Manufacturing Company and all regulations applicable to the vessel such as Subchapter F of Title 46 of the Code of Federal Regulations. Solvent cemented joints shall be assembled using a "two-step" primer and CPVC cement joining system. Refer to Spears® EverTUFF® CPVC Schedule 40 & 80 marine pipe and fittings system technical guide for more information on installation, product weights & dimensions.

**NOTE:** Spears® thermoplastic piping systems are suitable for oil-free air handling to 25 psi, not for distribution of compressed air or gas.

**Referenced Standards:**

- ASTM D1784 – Rigid Vinyl Compounds
- ASTM F441 – CPVC Schedule 40 & 80 Pipe
- ASTM F439 – CPVC Schedule 80 Fittings
- ASTM F493 – Cement for CPVC Pipe & Fittings
- IMO 2010 FTP Code - Fire Test Procedure
- Title 46 CFR – Code of Federal Regulations

**Approvals:**

- ABS – American Bureau of Shipping • USCG – US Coast Guard (#164.141/45/0)
- NSF® – NSF International • Transport Canada • UL – GREENGUARD GOLD Certified

**PROJECT APPROVAL**

Approved: \_\_\_\_\_ PRINT

Sign: \_\_\_\_\_

Date: \_\_\_\_\_





# Marine Submittal for Spears® Manufacturing Company EverTUFF® CPVC Schedule 40 & 80 Pressure Systems

## EVERTUFF® CPVC MARINE PIPE

Schedule 40

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./ft.	Rating at 73°F, psi
1/2	0.840	0.602	0.109	0.190	600
3/4	1.050	0.804	0.113	0.253	480
1	1.315	1.029	0.133	0.371	450
1-1/4	1.660	1.360	0.140	0.502	370
1-1/2	1.900	1.590	0.145	0.599	330
2	2.375	2.047	0.154	0.803	280
2-1/2	2.875	2.445	0.203	1.267	300
3	3.500	3.042	0.216	1.660	260
4	4.500	3.998	0.237	2.363	220
6	6.625	6.031	0.280	4.164	180
8	8.625	7.942	0.322	6.268	160
10	10.750	9.976	0.365	8.886	140
12	12.750	11.889	0.406	11.751	130

Schedule 80

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./ft.	Rating at 73°F, psi
1/2	0.840	0.526	0.147	0.238	850
3/4	1.050	0.722	0.154	0.322	690
1	1.315	0.936	0.179	0.473	630
1-1/4	1.660	1.255	0.191	0.654	520
1-1/2	1.900	1.476	0.200	0.793	470
2	2.375	1.913	0.218	1.097	400
2-1/2	2.875	2.290	0.276	1.674	420
3	3.500	2.864	0.300	2.242	370
4	4.500	3.786	0.337	3.277	320
6	6.625	5.709	0.432	6.258	280
8	8.625	7.565	0.500	9.506	250
10	10.750	9.493	0.593	14.095	230
12	12.750	11.294	0.687	19.392	230

CPVC Pipe

Operating Temp (°F)	De-Rating Factor
73-80	1.00
90	0.91
100	0.82
110	0.72
120	0.65
130	0.57
140	0.50
150	0.42
160	0.40
170	0.29
180	0.25
200	0.20

Thermal Expansion Table

**De-Rating Example:** Determine the maximum allowable operating pressure for a 3-inch CPVC Schedule 40 piping system with an operating temperature of 140°F. Using de-rating factor of 0.50 for 140°F, multiply pressure rating at 73°F by de-rating factor. A 3-inch CPVC Schedule 40 pipe would = 260 x 0.50 = 130 psi @ 140°F.

Length of Run (L) in feet	Length Change in inches (ΔL) for Specified Change in Temperature (ΔT)								
	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F
10	.08	.12	.15	.19	.23	.27	.31	.35	.38
20	.15	.23	.31	.38	.46	.54	.61	.69	.77
40	.31	.46	.61	.77	.92	1.08	1.23	1.38	1.54
50	.38	.58	.77	.96	1.15	1.34	1.54	1.73	1.92
70	.54	.81	1.08	1.34	1.61	1.88	2.15	2.42	2.69
90	.69	1.04	1.38	1.73	2.07	2.42	2.76	3.11	3.46
120	.92	1.38	1.84	2.30	2.76	3.23	3.69	4.15	4.61

CPVC Pipe Support Spacing (Ft) at °F (C)

Nominal Pipe Size (in)	Schedule 40							C
	60°F (16°C)	100°F (38°C)	120°F (49°C)	140°F (60°C)	160°F (71°C)	180°F (82°C)	200°F (93°C)	
1/2	5.0	4.5	4.5	4.0	2.5	2.5	C	
3/4	5.5	5.0	4.5	4.0	2.5	2.5	C	
1	6.0	5.5	5.0	4.5	3.0	2.5	C	
1-1/4	6.0	5.5	5.5	5.0	3.0	3.0	1.5	
1-1/2	6.5	6.0	5.5	5.0	3.5	3.0	1.5	
2	6.5	6.0	5.5	5.0	3.5	3.0	1.5	
2-1/2	7.5	7.0	6.5	6.0	4.0	3.5	1.5	
3	8.0	7.0	7.0	6.0	4.0	3.5	2.0	
4	8.5	7.5	7.0	6.5	4.5	4.0	2.0	
6	9.5	8.5	8.0	7.5	5.0	4.5	2.0	
8	10.0	9.0	8.5	8.0	5.0	4.5	2.0	
10	10.5	9.5	9.0	8.5	5.5	5.0	2.0	
12	11.0	10.0	9.5	9.0	6.0	5.5	2.5	

CPVC Pipe Support Spacing (Ft) at °F (C)

Nominal Pipe Size (in)	Schedule 80							C
	60°F (16°C)	100°F (38°C)	120°F (49°C)	140°F (60°C)	160°F (71°C)	180°F (82°C)	200°F (93°C)	
1/2	5.5	5.0	4.5	4.5	3.0	2.5	C	
3/4	5.5	5.5	5.0	4.5	3.0	2.5	C	
1	6.0	6.0	5.5	5.0	3.5	3.0	1.5	
1-1/4	6.5	6.0	6.0	5.5	3.5	3.0	1.5	
1-1/2	7.0	6.5	6.0	5.5	3.5	3.5	2.0	
2	7.0	7.0	6.5	6.0	4.0	3.5	2.0	
2-1/2	8.0	7.5	7.5	6.5	4.5	4.0	2.5	
3	8.0	8.0	7.5	7.0	4.5	4.0	2.5	
4	8.5	9.0	8.5	7.5	5.0	4.5	2.5	
6	10.0	9.5	9.0	8.0	5.5	5.0	3.0	
8	11.0	10.5	10.0	9.0	6.0	5.5	3.5	
10	11.5	11.0	10.5	9.5	6.5	6.0	4.0	
12	12.5	12.0	11.5	10.5	7.5	6.5	4.5	

