

Stephens Pipe and Steel, LLC
OnGuard SPS 40E Galvanized Chain Link Framework
CONSTRUCTION SPECIFICATION – 32 31 13

PART 2 - MATERIALS

2.01 MANUFACTURER

Framework for galvanized chain link fence systems shall conform to Stephens Pipe and Steel SPS 40E manufactured by Stephens Pipe and Steel OnGuard Fence Systems in Russell Springs, KY

2.02 MATERIAL – STEEL FRAMEWORK

- A. The steel material used to manufacture Stephens Pipe and Steel SPS 40E shall be zinc-coated steel strip, galvanized by the hot-dip process conforming to the criteria of ASTM A653/A653M and the general requirements of ASTM A924/A924M.
- B. The zinc used in the galvanizing process shall conform to ASTM B6. Weight of zinc shall be determined using the test method described in ASTM A90 and shall conform to the weight range allowance for ASTM A653, Designation G-210.
- C. The framework shall be manufactured in accordance with commercial standards to meet the strength (50,000 psi minimum yield strength) and coating requirements of the following standards:
 - 1) ASTM F1043, Group IC, Electrical Resistance Welded Round Steel Pipe, heavy industrial weight.
 - 2) M181, Type I, Grade 2, Electrical Resistance Welded Steel Pipe
 - 3) RR-F-191/3, Class 1, Grade B, Electrical Resistance Welded Steel Pipe
- D. The exterior surface of the electrical resistance weld shall be recoated with the same type of material and thickness as the basic zinc coating.
- E. A chromate conversion coating shall be applied to the external surface. The chromate shall be 30-micrograms/in² ± 15 micrograms/in² and shall be verified by a strip and weigh method utilizing an atomic absorption spectrophotometer or x-ray fluorescence spectrograph.
- F. A clear coat shall be applied over the chromate conversion coating. Clear polymeric coatings shall be a clear film applied in a manner assuring good adhesion. The existence of a clear film coating shall be verified by a 15-second contact with a copper sulfate solution (specific gravity 1.186) at three separate locations on a specimen. Copper sulfate will react with zinc to form a

black deposit of copper anywhere the zinc is not protect by the clear polymeric coating. The exterior clear-coated surface must demonstrate the ability to withstand exposure of 500 hours without failure at a black panel temperature of 145° F when tested in accordance with ASTM D1499. The clear coat shall also withstand 500 hours of exposure to 100% relative humidity per ASTM D2247 without blistering or peeling and 950 hours of exposure to salt spray per ASTM B117 with a maximum of 5% red rust.

- G. The strength of Stephens Pipe and Steel SPS 40E r® shall conform to the requirements of ASTM F1043; the minimum weight shall not be less than 90% of the nominal weight (see Table 1). The strength of line, end, corner and pull posts shall be determined by the use of 4' or 6' cantilevered beam test. The top rail shall be determined by a 10' free-supported beam test (see Table 1). An alternative method of determining pipe strength is by the calculation of bending moment (see Table 1). Conformance with this specification can be demonstrated by measuring the yield strength of a randomly selected piece of pipe from each lot and calculating the section modulus. The yield strength shall be determined according to the methods described in ASTM E8. For materials under this specification, the 0.2 offset method shall be used in determining yield strength. Terminal posts, line posts and top/bottom rails shall be precut to specified lengths.

TABLE 1

Fence Industry	Decimal O.D. Equivalent		Pipe Wall Thickness		Weight		Section Modulus	x	Min. Yield Strength	=	Max Bending Moment	Calculated Load (lbs.)		
	inches	(mm)	inches	(mm)	Lb./ft.	(kg/m)						inches	psi	lb. in.
1-5/8"	1.660	42.16	.111	2.82	1.84	2.74	.1961	x	50,000	=	9,805	327	204	136
2"	1.900	48.26	.120	3.05	2.28	3.39	.2810	x	50,000	=	14,050	468	293	195
2-1/2"	2.375	60.33	.130	3.30	3.12	4.64	.4881	x	50,000	=	24,405	814	508	339
3"	2.875	73.03	.160	4.06	4.64	6.90	.8778	x	50,000	=	43,890	1,463	914	610
4"	4.000	101.60	.160	4.06	6.56	9.76	1.7819	x	50,000	=	89,095	2,970	1,856	1,237