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## **OnGuard SPS20 Galvanized Chain Link Framework CONSTRUCTION SPECIFICATION – 32 31 13**

### **PART 2 – MATERIALS**

#### **2.01 MANUFACTURER**

Framework for galvanized chain link fence systems shall confirm to Stephens Pipe & Steel SPS20 manufactured by Stephens Pipe & Steel OnGuard Fence Systems in Russell Springs, KY.

#### **2.02 MATERIAL – STEEL FRAMEWORK**

- A. The steel material use to manufacture Stephens Pipe & Steel SPS20 shall be zinc coated steel strip, galvanized by the hot dipped process confirming to the criteria of ASTM A653/653M and the general requirements of ASTM A924/A924M.
- B. The zinc used in the galvanizing process shall conform to ASTM B6. Weight of zince shall be determined using the test method described in ASTM A90 and shall conform to the weight range allowance for ASTM A653, Designation G-60.
- C. The framework shall be manufactured in accordance with commercial standards to meet the strength and coating requirements.
- D. The exterior surface of the electrical resistance weld shall be re-coated with the same type of material and thickness as the basic zinc coating.
- E. A chromate conversion coating shall be applied to the externazl surface. The chromate shall be 30 micrograms/in<sup>2</sup> +/- 15 micrograms/in<sup>2</sup> 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 protected 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 & Steel SPS20 shall confirm to the requirements of ASTM A1011; the minimum weight shall not be less than 90% of the normal 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 & top/bottom rails shall be precut to special lengths.

**SPS20 PHYSICAL DIMENSION & STRENGTH CALCULATIONS**  
**TABLE 1**

Fence Industry	Dexcimal O.D. Equivalent		Pipe Wall Thickness		Weight		Minimum Yield Strength PSI	Calculated Load (lbs.)		
	inches	(mm)	inches	(mm)	Lb.	Kg/m		10' Free Supported	Cantilever	
O.D									4	6
1-3/8"	1.315	33.40	.080	2.03	1.056	1.57	45,000	150	–	–
1-5/8"	1.660	42.16	.085	2.16	1.431	2.13	45,000	262	164	109
2"	1.900	48.26	.090	2.29	1.741	2.59	45,000	–	230	154
2-1/2"	2.375	60.33	.095	2.41	2.315	3.44	45,000	–	389	259
3"	2.875	73.03	.110	2.79	3.251	4.84	45,000	–	663	442