

02830/ALL
Buyline 3404

SS40[®]



 **allied**
TUBE & CONDUIT
FENCE DIVISION



Allied Tube & Conduit, with an engineering breakthrough in pipe manufacturing and corrosion resistant coating, has developed the most specified and the most requested framework in the fencing industry.

SS-40 is manufactured with cold-formed steel which provides a high yield/tensile strength, followed by a uniform triple layer of corrosion protection. The coating consists of zinc, chromate, and a clear organic top coat applied in-line by Allied's patented continuous Flo-Coat® process.

The high yield strength steel and the triple coat of *locked-in* protection, results in pipe that not only out-performs Schedule 40 pipe in strength and corrosion resistance, but maintains its lustrous appearance in all climates and under the most severe atmospheric conditions. SS-40 is clearly the industry leader.

Technical Specifications

1. Scope

This specification covers galvanized steel fence pipe as manufactured by the Allied Tube & Conduit patented Flo-Coat process.

2. Materials

2.1 Steel

Steel strip used in the manufacture of pipe shall conform to ASTM A 569 and will meet all performance criteria set forth in this standard/specification.

2.2 Zinc

Zinc used in Allied's Flo-Coat process conforms to ASTM B 6 High Grade and Special High Grade Zinc.

2.3 Chromate

The chromate conversion coating is applied over the surface of the zinc to enhance corrosion resistance.

2.4 Organic Clear Coating

Organic clear coating, applied over the chromate conversion coating, is manufactured from high grade raw materials.

2.5 Internal Coating

The internal zinc-rich based coating shall have a minimum zinc powder loading of 90% by weight and have the capability of producing galvanic protection.

3. Weight of Coatings

3.1 Zinc

Weight of zinc shall be 1.0 oz./ft.² ± 0.1 oz./ft.² and shall be determined by the method described in ASTM A 90.

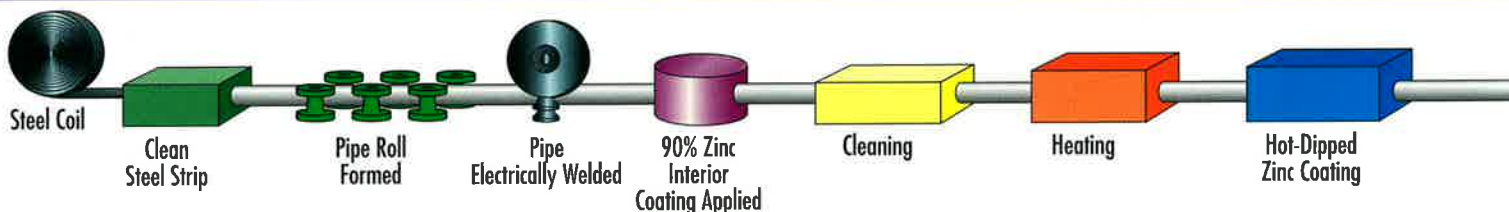
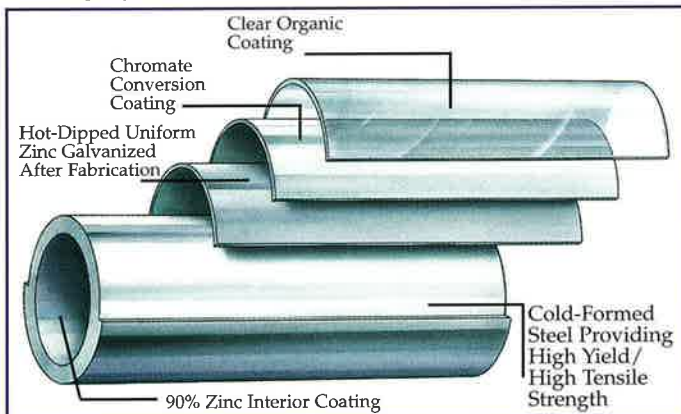
3.2 Chromate Conversion Coating

Chromate coating shall be 30 micrograms/in.² ± 15 micrograms/in.² and shall be determined by a strip and weigh method utilizing an atomic absorption spectrophotometer or X-Ray fluorescence spectrograph.

3.3 Organic Clear Coating

Thickness of the clear coating shall be a nominal .5 mils ± .2 mils and shall be determined by measurement with a suitable magnetic or eddy current coating thickness tester. Thickness of clear coating is determined by taking the difference between the thickness

of zinc and the total thickness of the clear coating and zinc. The thickness tester shall be standardized on the steel surface after removing the zinc prior to making measurements.



4. Strength Characteristics

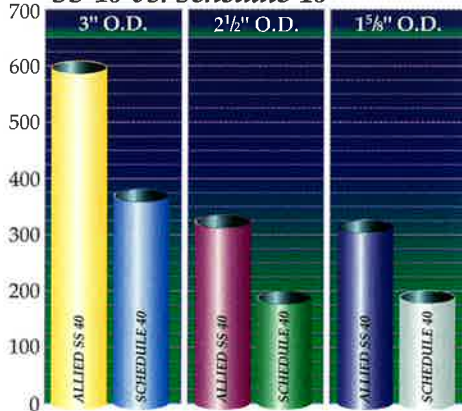
4.1 Bending Strength

The strength of line, end, corner, and pull posts shall be determined by the use of 4 foot or 6 foot cantilevered beam test. The top rail shall be determined by a 10 foot free-supported beam test (see Table 1).

4.2 Bending Moment

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/tensile strength of a randomly selected piece of pipe from each lot and calculating the section modulus. The yield/tensile strength shall be determined according to the methods described in ASTM E 8. For materials under this specification, the 0.2 offset method shall be used in determining yield strength.

**Bending Strength Comparison
SS 40 vs. Schedule 40**



Test results are based on 6 foot Cantilevered beam test and 10 foot free-supported beam test.

5. Corrosion Resistance

5.1 Salt Spray

a. Exterior Surface. The exterior clear coated surface of the pipe shall have a demonstrated ability to resist 1000 hours of exposure to salt fog with a maximum of 5% red rust when conducted in accordance with ASTM B 117.

b. Interior Surface. The interior zinc rich coated surface shall have a demonstrated ability to withstand 650 hours of exposure to salt fog with a maximum of 5% red rust when conducted in accordance with ASTM B 117.

5.2 Humidity

a. Exterior Surface. The clear coated exterior surface of the pipe shall have a demonstrated ability to resist 500 hours of exposure to 100% relative humidity without blistering and peeling when conducted in accordance with ASTM D 4585. (D 2247).

5.3 Weatherometer

a. Exterior Surface. The clear exterior coating shall have a demonstrated ability to withstand exposure for 500 hours without failure at a black panel temperature of 145°F. (63°C.) when tested in accordance with ASTM G 26, Xenon Type BH apparatus, or ASTM G 23 (Carbon Arc) Type HH apparatus.

Performance

For nearly forty years, SS-40 has disproven the common belief that greater weight equals greater strength. SS-40 is 20% lighter than Schedule 40 in gauge and weight, yet is as much as 33% stronger.

The superior strength of SS-40 is attributable to two key factors:

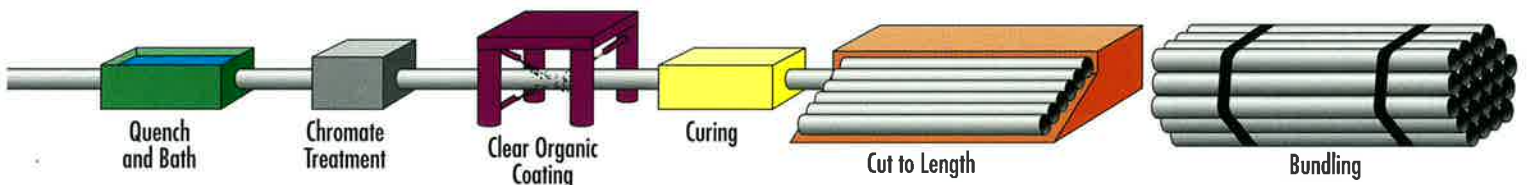
1. Cold rolled steel with a minimum of 50,000 psi yield strength.
2. The tempering effect of cold water quenching following the hot-dip galvanizing.

Exceptional corrosion resistance is achieved through Allied's patented Flo-Coat process. A uniform layer of zinc is applied, followed by total immersion in chromate, and finally a clear organic top coat. The triple coating minimizes oxidation and locks-in the corrosion protection to preserve a "like new" appearance. It is the combination of zinc, chromate and clear organic top coat, that produces a "synergistic" effect which results in greater corrosion resistance than the sum of the individual coatings.

The triple coating, uniformly applied during the Flo-Coat process, gives SS-40 a highly lustrous appearance that will fabricate without flaking and remain maintenance-free. When performance is the **only true criterion**, SS-40 is the obvious choice.

Availability

SS-40 is manufactured by Allied Tube & Conduit in Harvey, IL and Philadelphia, PA. A full inventory of standard lengths is maintained at both locations to insure fast delivery and to meet even the strictest schedules. If special lengths are required, ask about Allied's cut-to-length capabilities. Made-to-order lengths will help reduce fabrication time, eliminate wasteful drops and additional handling costs. Our nationwide distribution network and coast-to-coast shipping system helps Allied retain its position as **Number One Supplier** to the fence industry.



Certification

"Made in U.S.A." is proudly displayed on every length of SS-40 pipe. Allied will certify that all SS-40 fence pipe is manufactured in the USA and is in compliance with applicable Federal, State and local specifications.

Specifying Agencies

Partial list of agencies which have approved SS-40.

- (AASHTO) American Associations of State Highway and Transportation Officials M181-93
- Federal Specifications RR-F-191/2D (Chain Link Fence Gates)
- Federal Specifications RR-F-191/3D (Chain Link Fence Posts, Top Rails and Braces)
- Corps of Engineers CEGS-02831
- Department of the Navy NFGS-02831
- Department of Transportation Federal Aeronautics Administration AC 150/5370-10A Item F-162
- U.S. Department of Justice - Federal Bureau of Prisons
- ASTM Specification F1043-95. Standard Specification for Strength and Protective Coatings
- American Institute of Architects (AIA) MASTERSPEC

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Table 1 Physical Dimensions and Strength Calculations SS-40 Pipe Sizes

Fence Industry O.D.	Decimal O.D. Equivalent		Pipe Wall Thickness		Weight		Section Modulus inches ³	Min. Yield Strength psi	Max Bending = Moment lb. in.	Calculated Load (lbs.)		
	inches	(mm)	inches	(mm)	lb./ft.	(kg/m)				10' Free Supported	Cantilever	
										4'	6'	
1-3/8"	1.315	33.40	.104	2.64	1.35	2.01	.1111	x 50,000	= 5555	185	116	77
1-5/8"	1.660	42.16	.111	2.82	1.84	2.74	.1961	x 50,000	= 9805	327	204	136
2"	1.900	48.26	.120	3.05	2.28	3.39	.2810	x 50,000	= 14050	468	293	195
2-1/2"	2.375	60.33	.130	3.30	3.12	4.64	.4881	x 50,000	= 24405	814	508	339
3"	2.875	73.03	.160	4.06	4.64	6.90	.8778	x 50,000	= 43890	1463	914	610
3-1/2"	3.500	88.90	.160	4.06	5.71	8.50	1.3408	x 50,000	= 67040	2235	1397	931
4"	4.000	101.60	.160	4.06	6.56	9.76	1.7819	x 50,000	= 89095	2970	1856	1237

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