



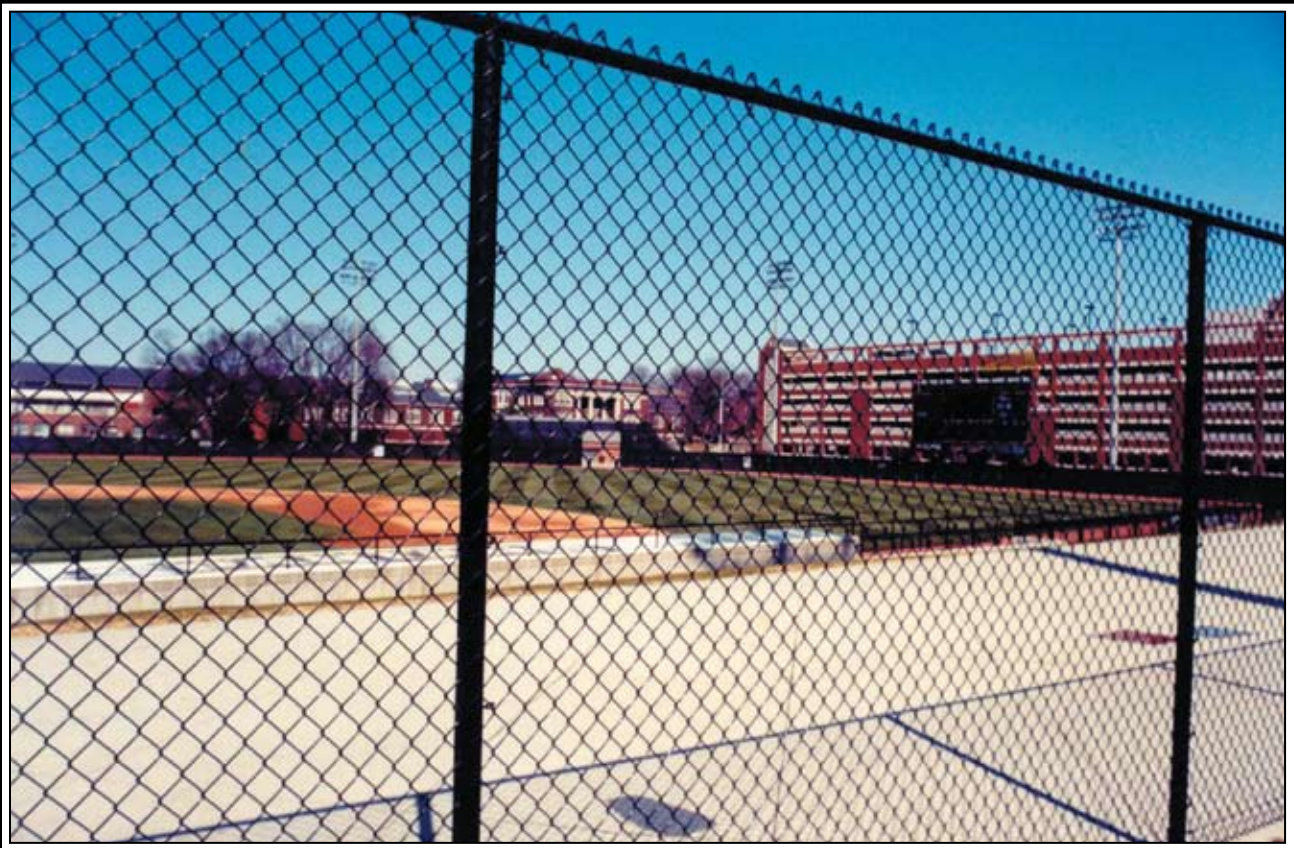
for Architects & Specifiers

PermaCoat®

Color Chain Link Fence

& TransPort™

Chain Link Gates



University of North Carolina
Greensboro, NC

Maintenance-Free PermaCoat® Finish
Over Galvanized High Strength Steel

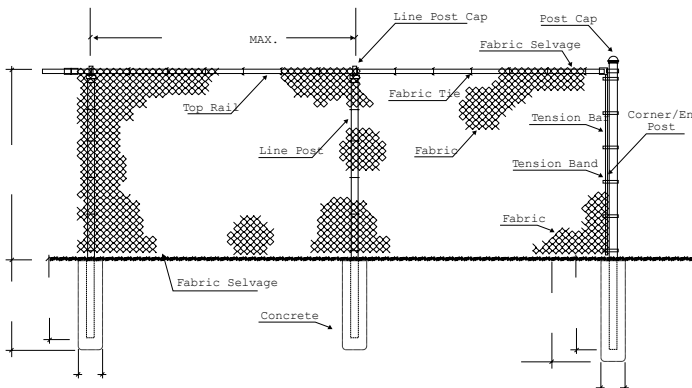
www.ameristarfence.com



Ameristar® was chartered several years ago to provide specialty fence products that were more affordable but did not compromise the quality level demanded by specifiers and consumers. This could be accomplished only by complete reformation of the way fence products were being manufactured. Product design was approached from many new perspectives: maximizing high-volume productivity; increasing strength and durability; promoting ease of installation; ensuring an environmentally friendly workplace; and enhancing aesthetic appearance. A new plant was designed and built to house state-of-the-art roll-forming, metal processing and powder coating equipment. The result (shown in the photo above) has boosted Ameristar to its current position as the manufacturing leader in specialty fence production.

DETAILED PRODUCT DATA

Ameristar's electronic media enable architects and specifiers to simply download specification information directly into the appropriate section of their CSI-formatted project specifications; they also enable the direct downloading of product drawings onto project blueprints.



- **Architectural Binder**
The adjacent PermaCoat® series drawing is one of several shop drawings contained in Ameristar's Architectural Binder. Available upon request.
- **Internet Website**
The Ameristar® website (<http://www.ameristarfence.com>) enables the user to browse the entire Ameristar® product line. The site is complete with photos, drawings, specifications and installation procedures.

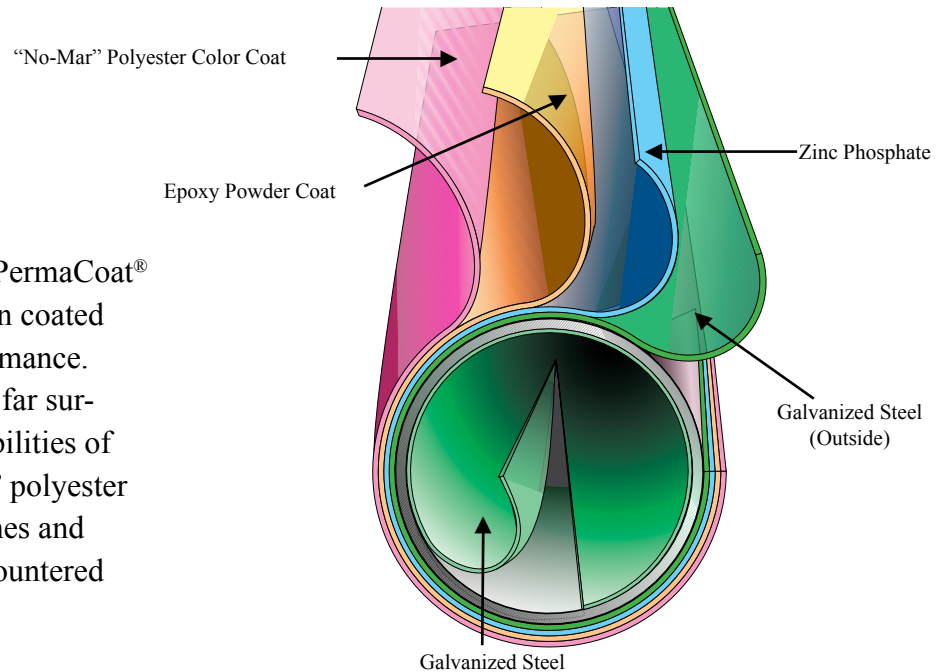
PERMACOAT®

The Product Leader in Color Chain Link Fencing

Any truly great product must have a defining feature that sets it apart from all others; PermaCoat's double coating system, results in a coating durability and life superior to all other coated chain link fence systems.



Electrostatic application in the PermaCoat® powder coating system results in coated surfaces with unmatched performance. The base coat of epoxy powder far surpasses the corrosion resisting abilities of painted surfaces. The “no-mar” polyester powder top coat reduces scratches and burnishing marks normally encountered during shipping.



FRAMEWORK

The fence framework was designed and developed to answer the need for a more durable, attractive and affordable framing product. It is produced from high yield strength galvanized steel, using state-of-the-art mill forming and in-line welding techniques. It is coated with the PermaCoat® powder coating system, with its double layer of protection (actually powder coated twice). The base coat is an epoxy moisture barrier that is thermally fused to the galvanized substrate and is known for its outstanding corrosion resistance. The finish coat is a thermo-setting TGIC “no-mar” polyester with enhanced UV resistance to maintain a beautiful color finish for a lifetime of maintenance-free enjoyment.

COLORS



Black



Green



Brown

SUPERIOR FINISH

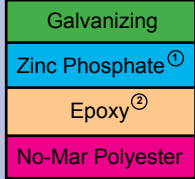
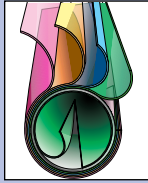
**AMERISTAR®
PERMACOAT®
(DOUBLE COATED)**

**CONVENTIONAL
POLYESTER
(ONE COAT)**

**CONVENTIONAL
POLY-VINYL CHLORIDE
(ONE COAT)**

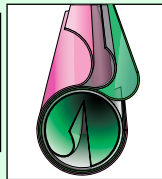
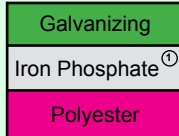
PROTECTIVE APPLICATIONS

PermaCoat® Fence System

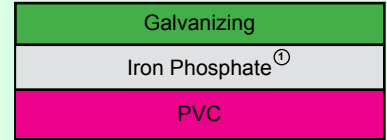


Double Coating
(5 to 6 Mils.)

Conventional Polyester Fence Systems



Conventional PVC Fence Systems

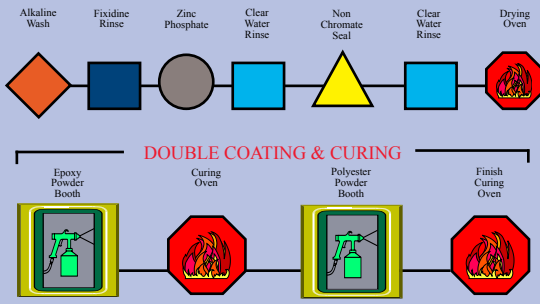


SALT SPRAY RESISTANCE (ASTM B117)		
3,500 Hrs.	1,200 Hrs.	.500 Hrs.

- ① Zinc compounds are used in the phosphatizing process because they add a significant amount of sacrificial cathodic protection. The zinc is much more active than steel; therefore, the zinc must oxidize before the steel is free to corrode. Iron phosphate, by contrast, provides no sacrificial cathodic advantage when applied to steel.
- ② The epoxy in the first of Ameristar's two coating applications provides an effective barrier to moisture and humidity; acting as a primer (3 mils thick) between the galvanized substrate and the polyester finish coat.

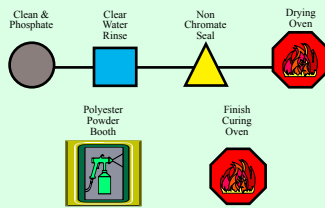
PRE-TREATMENT/COATING PROCESS

11 Stage PermaCoat® Double-Coating Process
7 STAGE PRE-TREATMENT



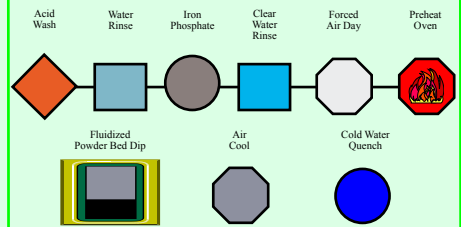
All fence parts, gates and accessories are given complete double PermaCoat® application.

Conventional Polyester Process



Simultaneous cleaning and phosphatizing significantly decreases the effectiveness of both treatments.

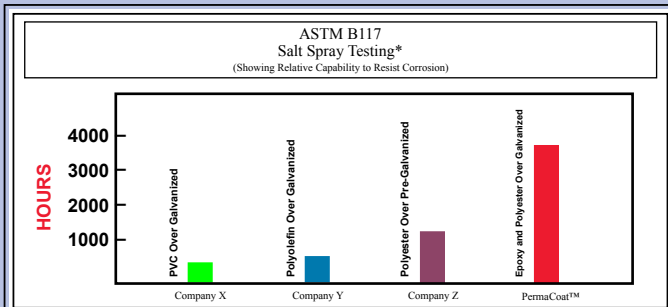
Conventional PVC Process



Curing is by a melt and quench process wherein the PVC material solidifies against the base metal surface. Adhesion is suspect and can vary greatly with small ambient changes.

CORROSION RESISTANCE

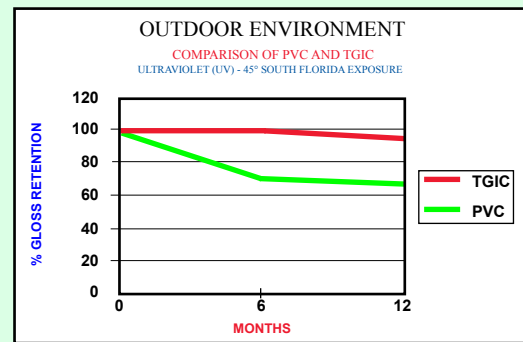
PermaCoat® significantly exceeds PVC and one coat polyester finishes in its ability to resist corrosion. ASTM B117 test results below show the dramatic difference.



* Testing to ASTM B-117 with scribe to ASTM D1654 - Failure mode of 1/8-inch undercut or medium #8 blisters.

UV RESISTANCE

PermaCoat® is far superior to PVC in resistance to the harmful effects of UV radiation, as shown below using South Florida exposure tests.



Ameristar® is America's premier manufacturer of color chain link fence materials. Applying the most extensive surface protection ever used on chain link fencing is one of the reasons our company has reached that achievement.

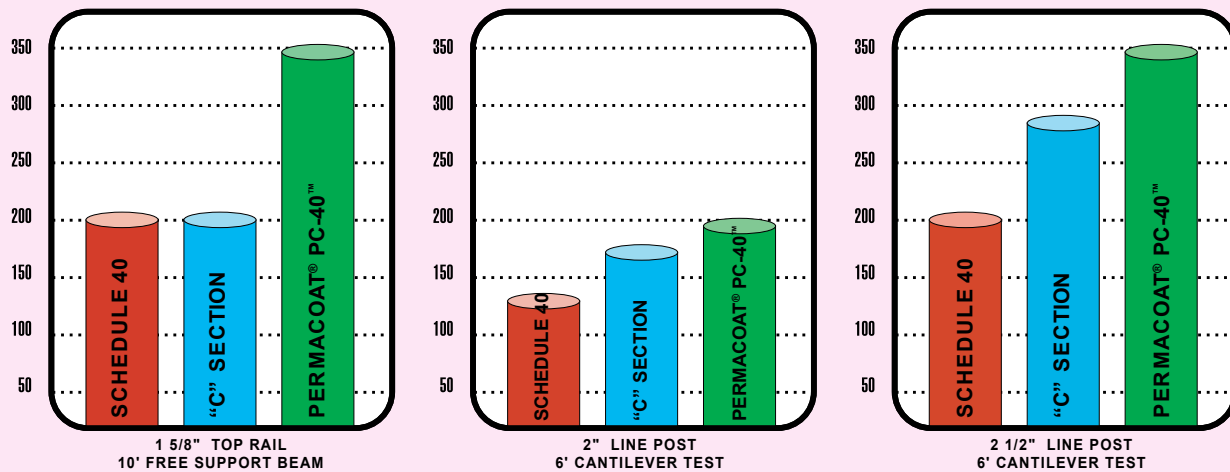
SUPERIOR STRENGTH

PERMACOAT® PC-40™ INDUSTRIAL STRENGTH PIPE PHYSICAL DIMENSIONS & STRENGTH CHARACTERISTICS

FENCE INDUSTRY O.D.	NOMINAL PIPE SIZE I.D.	ACTUAL O.D. (IN.)	WALL THICKNESS (IN.)	WT./FT. (POUNDS)	MIN. YIELD STRENGTH	X	(1) SECTION MODULUS	=	MAX. BENDING MOMENT LBS./IN.	10' FREE SUPPORTED LBS.	CALCULATED LOAD (LBS.)	
											CANTILEVER	
											4'	6'
1-5/8"	1-1/4"	1.660	.111	1.84	50,000	x	.1961	=	9,805	327	204	135
2"	1-1/2"	1.900	.120	2.28	50,000	x	.2810	=	14,050	468	293	195
2-1/2"	2"	2.375	.130	3.12	50,000	x	.4881	=	24,405	814	508	330
3"	2-1/2"	2.875	.160	4.64	50,000	x	.8778	=	43,890	1,463	914	610
4"	3-1/2"	4.000	.160	6.56	50,000	x	1.7819	=	89,095	2,969	1,856	1,237

(1) Nominal O.D. and minimum wall thickness

PERMACOAT® PC-40™ VS. SCHEDULE 40 & "C" SECTION BENDING STRENGTH COMPARISON



PERMACOAT® PC-20™ COMMERCIAL STRENGTH PIPE PHYSICAL DIMENSIONS & STRENGTH CHARACTERISTICS

FENCE INDUSTRY O.D.	NOMINAL PIPE SIZE I.D.	ACTUAL O.D. (IN.)	WALL THICKNESS (IN.)	WT./FT. (POUNDS)	MIN. YIELD STRENGTH	X	(1) SECTION MODULUS	=	MAX. BENDING MOMENT LBS./IN.	10' FREE SUPPORTED LBS.	CALCULATED LOAD (LBS.)	
											CANTILEVER	
											4'	6'
1-5/8"	1-1/4"	1.660	.085	1.43	50,000	x	.158	=	7,880	262	164	109
2"	1-1/2"	1.900	.090	1.74	50,000	x	.221	=	11,060	-	230	154
2-1/2"	2"	2.375	.095	2.31	50,000	x	.373	=	18,650	-	389	259
3"	2-1/2"	2.875	.110	3.25	50,000	x	.636	=	31,810	-	664	442

(1) Nominal O.D. and minimum wall thickness

Ameristar® is America's premier manufacturer of color chain link fence materials. Making the strongest fence pipe in its state-of-the-art roll-forming mill is one of the reasons for Ameristar's prominence.

SUPERIOR SYSTEM

APPLICATION		INDUSTRIAL <u>ASTM F668/F1043 & ASTM F1712</u> Sports Complexes • Recreational Facilities • Industrial Plant Facilities Government Facilities • Department of Transportation • Prisons	COMMERCIAL <u>ASTM F668/F1043 & F934</u> Nurseries • Mini-Storages • Golf Courses • Apartments • Office Complexes • Swimming Pools	TENNIS COURT <u>ASTM F969</u>	
PERMACOAT® FRAMEWORK	PRODUCT	PERMACOAT® PC-40 FENCE PIPE	PERMACOAT® PC-20 FENCE PIPE	PERMACOAT® FENCE PIPE	
	15 Year Warranty	Terminal Posts up to 6'	2.375" O.D. x .130" Wall 3.12 lb./ft.	2.375" O.D. x .095" Wall 2.31 lb./ft.	N/A
	Heights from 3' to 20'	Terminal Posts over 6'	2.875" O.D. x .160" Wall 4.64 lb./ft.	2.875" O.D. x .110" Wall 3.25 lb./ft.	2.875" O.D. x .160" Wall 4.64 lb./ft.
		Terminal Posts over 10'	4" O.D. x .160" Wall 6.56 lb./ft.	N/A	2.875" O.D. x .160" Wall 4.64 lb./ft.
	Black, Green or Brown PermaCoat® Epoxy & Polyester Powder Coating No-Mar Finish	Line Posts up to 6'	1.900" O.D. x .120" Wall 2.28 lb./ft.	1.900" O.D. x .090" Wall 1.74 lb./ft.	N/A
		Line Posts over 6'	2.375" O.D. x .130" Wall 3.12 lb./ft.	2.375" O.D. x .095" Wall 2.31 lb./ft.	2.375" O.D. x .130" Wall 3.12 lb./ft.
		Line Posts over 10'	2.875" O.D. x .160" Wall 4.64 lb./ft.	N/A	2.875" O.D. x .160" Wall 4.64 lb./ft.
		Rails & Bracing	1.660" O.D. x .111" Wall 1.84 lb./ft.	1.660" O.D. x .090" Wall 1.43 lb./ft.	1.660" O.D. x .090" Wall 1.43 lb./ft.
Type B Tubular Steel Framework With Supplemental Color Coating As Per ASTM F1043	Line Posts over 10'	2.875" O.D. x .160" Wall 4.64 lb./ft.	N/A	2.875" O.D. x .160" Wall 4.64 lb./ft.	

With the strength and surface protection manufactured into PermaCoat® chain link fence components, it is clear why Ameristar® is the premier source for all color chain link fence applications.

THE CHAIN LINK REVOLUTION

Color is now being demanded in ever increasing proportions over galvanized chain link fencing. Facility owners and managers wishing to retain the well known endurance of chain link systems while providing a perimeter that blends attractively with its surroundings are finding color systems to be the answer. Ameristar's PermaCoat® supplies the best answer for several reasons.

- ① **HIGHER QUALITY** – PermaCoat® is the only framework product with the double protection of epoxy (to resist corrosion) and TGIC polyester (to resist UV radiation). Ameristar's state-of-the-art factory houses the complete process from start to finish, employing rigid quality inspections as part of every operation.



- ② **ENVIRONMENTALLY FRIENDLY PRODUCTION** – The modern high-speed tube mill and the extensive pre-treating and coating line were designed to ensure an environmentally friendly workplace and product.
- ③ **LOWER COSTS** – Ameristar's direct manufacturing throughput system ensures a competitive initial cost but a significantly lower long term cost enabled by superior strength and higher quality coating. Maintenance or replacement costs of other systems raises their long term costs far beyond the PermaCoat® color system.
- ④ **SUPERIOR VALUE ALTERNATIVE** – PermaCoat® makes the increasingly popular color chain link fencing a preferred alternative, costing only a fraction more than galvanized chain link systems, while retaining the strength and endurance of the fence that was king over the past century.

PRODUCT PRESENTATION

PermaCoat® - The revolutionary leader in color chain link fence framework, form a fence system that is easily installed, giving an attractive, continuously smooth look to any line of fence.

INDUSTRIAL PC-40™ COLOR CHAIN LINK FENCE



Ameristar's PermaCoat® PC-40™ industrial color chain link not only control access, as one would expect from an industrial fence; they also enhance the beauty of the facilities and properties they surround.

The use of stainless steel fasteners with the PermaCoated framework, makes the PermaCoat® PC-40™ Industrial Fence the most attractive and durable industrial chain link fence available.

PRODUCT PRESENTATION

COMMERCIAL PC-20™ COLOR CHAIN LINK FENCES



Security and protection are blended into an attractive appearance with the PermaCoat® PC-20™ commercial chain link fence system. PermaCoat® PC-20™ utilizes considerably stronger framework than that used for conventional galvanized commercial chain link fences, thus ensuring the optimum in available systems.

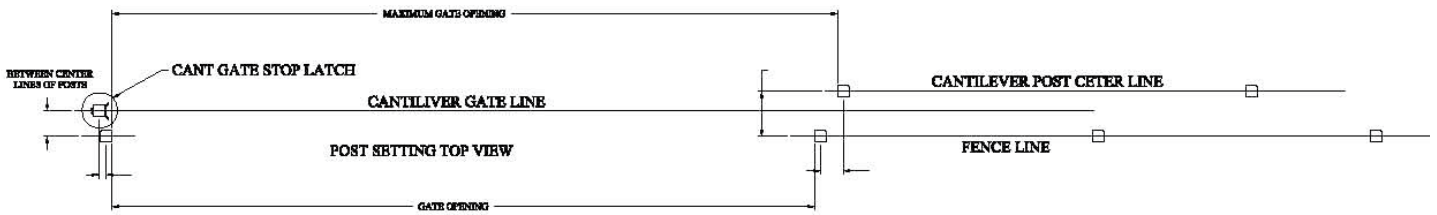
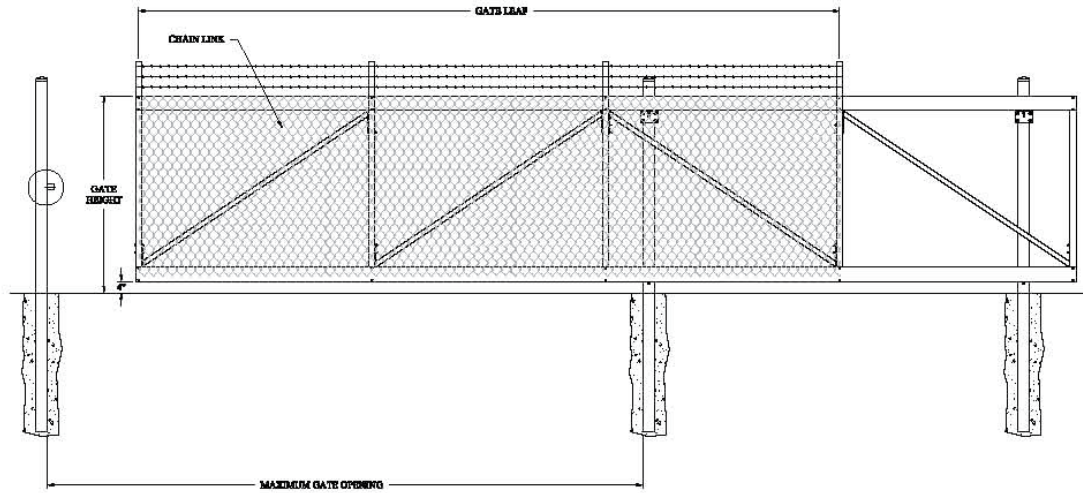
TENNIS COURT COLOR CHAIN LINK FENCES



The appropriate combination of framework materials from Ameristar's PermaCoat® Industrial PC-40™ and Commercial PC-20™ works best for tennis court perimeters, whether single courts or entire complexes.

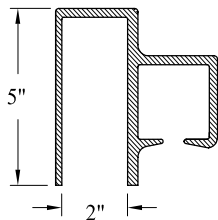
TRANSPORT™ CANTILEVER GATE SYSTEMS

TransPort™ Cantilever Gate Systems are available for both chain link and ornamental applications. The TransPort™ is an all weather cantilever gate utilizing an aluminum track extrusion with internal roller assemblies. This results in the gate and track system sliding as a single unit with virtually no frictional resistance.



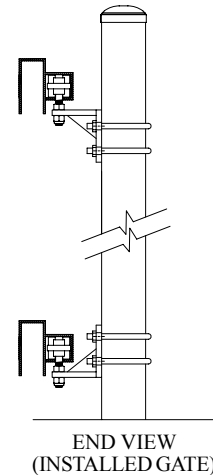
STRENGTH

TransPort™ Cantilever Gates offer superior strength as the track is 60% heavier (by weight) than competitors extrusions.



SINGLE FAST-TRAK™ TOP RAIL
WEIGHT = 5.30 LBS./FT.

ALIGNMENT



TRANSPORT™ CANTILEVER GATE SYSTEMS

SPECIFICATION

TransPort™ Aluminum-Framed Chain Link Cantilever Gate

2.01 MANUFACTURER

The cantilever gate system shall conform to Ameristar® TransPort™ chain link style (specify single or double), opening (specify total gate opening in feet), height (total in feet), gate direction (specify direction gate opens from outside looking in), (specify with or without barbed wire), with (specify cross sectional size and gauge of posts) posts.

2.02 MATERIALS

A. The materials used for cantilever gate framing shall be manufactured from aluminum (Designation 6063-T6) with a

yield strength of 25,000 psi, a tensile strength of 30,000 psi and a standard mill finish. The TransPort™ top track and bottom rail shall be manufactured from aluminum (Designation 6005-T5) with a yield strength of 35,000 psi, a tensile strength of 38,000 psi and a standard mill finish.

B. TransPort™ chain link cantilever gates shall be filled with the same fabric applicable to the chain link fencing material specified.

C. Each gate section shall be supplied with truss cables for proper bracing.

D. Two upper suspension rollers and two lower guide rollers shall be included with each gate.

2.03 FABRICATION

A. Components shall be precut to specified lengths.

B. All fastener holes shall be pre-drilled.

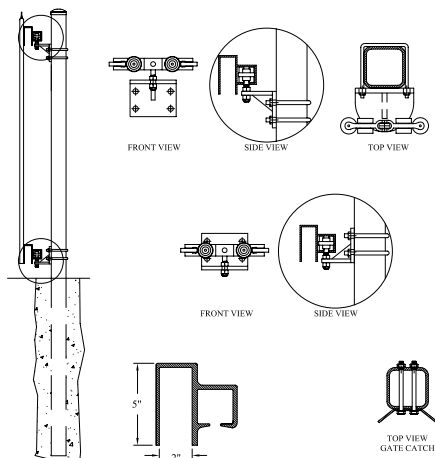
C. Completed framing components shall be tested for alignment and fit at the factory prior to shipping.

TRANSPORT™ TRACK HARDWARE

Ameristar's unique single mainframe truck roller makes it the strongest truck assembly available in the industry.

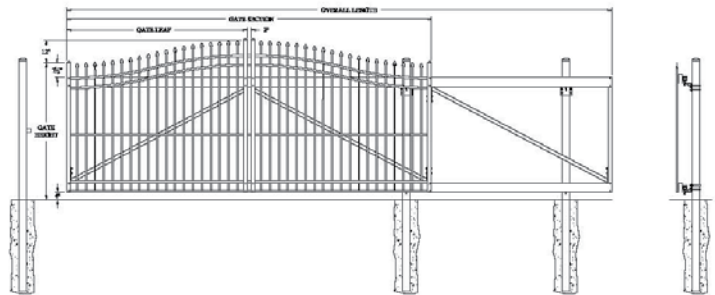
FEATURES

- Hot-Dip Galvanized
- Extra Heavy-Duty
- Solid Bar Truck Assembly
- With U-Bolts for either Round or Square Posts

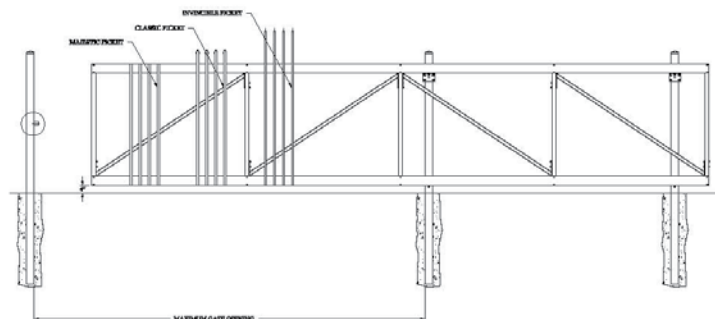


OTHER FINE AMERISTAR® GATE SYSTEMS

Ornamental Estate™ Cantilever Gates



Ornamental Aluminum Cantilever Gates



**CONSTRUCTION SPECIFICATION FOR CHAIN LINK FENCE, COMMERCIAL, COLOR
UTILIZING AMERISTAR® PERMACOAT® PC-20™ FENCE PIPE**

PART 1 – GENERAL

- 1.01 WORK INCLUDED**
The contractor shall provide all labor, materials and appurtenances necessary for installation of the color chain link fencing system defined herein at ([specify project site](#)).
- 1.02 RELATED WORK**
Section 02500 – Paving and Surfacing
Section 03300 – Case-In-Place Concrete
Section 04200 – Unit Masonry
- 1.03 SYSTEM DESCRIPTION**
The contractor shall supply a total color chain link fencing system of the design, style and strength defined herein. The system shall include all components (i.e., framework, chain link fabric, gates and fittings) required.
- 1.04 QUALITY ASSURANCE**
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.
- 1.05 REFERENCES**
A. American Society for Testing and Materials (ASTM) Standards: A90/A90M - Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings. A653/A653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. A924/A924M - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process. B6 - Specification for Zinc. B117 - Practice for Operating Salt Spray (Fog) Apparatus. D1499 - Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics. D3359 - Test Methods for Measuring Adhesion by Tape Test. E8/E8M - Test Methods for Tension Testing of Metallic Materials. F567 - Practice for Installation of Chain-Link Fence. F626 - Specification for Fence Fittings. F668 - Specification for Poly (Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric. F900 - Specification for Industrial and Commercial Swing Gates. F934 - Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials. F969 - Practice for Construction of Chain-Link Tennis Court Fence. F1043 - Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework. F1184 - Specification for Industrial and Commercial Horizontal Slide Gates.
B. American Association of State Highway and Transportation Officials (AASHTO) Standards: M181 - Standard Specification for Chain-Link Fence.
C. United States Federal Supply Service General Services Administration Specifications: RR-F-191/3 - Federal Specification Sheet for Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) - Detail Specification.
- 1.06 SUBMITTAL**
The manufacturer's literature shall be submitted prior to installation.
- 1.07 PRODUCT HANDLING AND STORAGE**
Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

- 2.01 MANUFACTURER**
Framework for color chain link fence systems shall conform to Ameristar® PermaCoat® PC-20™ Fence Pipe (commercial weight), as manufactured by Ameristar® Fence Products in Tulsa, Oklahoma.
- 2.02 MATERIAL – STEEL FRAMEWORK**
A. The steel material used to manufacture Ameristar® PermaCoat® PC-20™ Fence Pipe 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-90.
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 ASTM F1043, Group IC, Electrical Resistance Welded Round Steel Pipe, light industrial weight.
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. The manufactured framework shall be subjected to the PermaCoat® process, a complete thermal stratification coating process (multi-stage, high-temperature, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish.
F. The material used for the base coat shall be a (gray color) thermosetting epoxy; the minimum thickness of the base coat shall be two (2) mils. The material used for the finish coat shall be a thermosetting “no-mar” TGIC polyester powder; the minimum thickness of the finish coat shall be two (2) mils. The stratification coated pipe shall demonstrate the ability to endure a salt-spray resistance test in accordance with ASTM B117 without loss of adhesion for a minimum exposure time of 3,500 hours. Additionally, the coated pipe shall demonstrate the ability to withstand exposure in a weather-ometer apparatus for 1,000 hours without failure in accordance with ASTM D1499 and to show satisfactory adhesion when subjected to the cross-hatch test, Method B, in ASTM D3359. The polyester finish coat shall not crack, blister or split under normal use.
G. The color of all framework shall be ([specify Black, Green or Brown](#)) in accordance with ASTM F934.
H. The strength of Ameristar® PermaCoat® PC-20™ Fence Pipe 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.
- 2.03 MATERIAL – FENCE FABRIC**
A. The material for chain link fence fabric shall be manufactured from galvanized steel wire. The weight of zinc shall meet the requirements of ASTM F668, Table 4. Galvanized wire shall be PVC-coated to meet the requirements of ASTM F668. The class of the fence fabric shall be ([specify Class 1 - Extruded, Class 2A - Extruded and Bonded or Class 2B - Fused and Bonded](#)).
B. Selvage: Top edge ([specify knuckled or twisted](#)) and bottom edge ([specify knuckled or twisted](#)).
C. Color: The coating color for the fence fabric shall be ([specify Black, Green or Brown](#)). Reference ASTM F668 and ASTM F934.
D. Wire Size: The size of the steel wire core shall be ([specify gauge](#)) gauge. (See Table 2); the finished size of the coated wire shall be ([specify gauge](#)) gauge (See Table 2).
E. Height and Mesh Size: The fabric height shall be ([specify height](#)) feet high with a mesh size of ([specify mesh size](#)) inches. (See Table 2).
- 2.04 MATERIAL – FENCE FITTINGS**
The material for fence fittings shall be manufactured to meet the requirements of ASTM F626. The coating for all fittings shall be the same PermaCoat® color coating system required for the framework (see 2.02); the color of all fittings and fasteners shall be ([specify Black, Green or Brown](#)) in accordance with ASTM F934. All fasteners shall be stainless steel.
- 2.05 MATERIAL – GATES**
Swing gates shall be manufactured and coated to meet the requirements of ASTM F900. Slide gates shall be manufactured to meet the requirements of ASTM F1184. The color of all gates shall be ([specify Black, Green or Brown](#)) in accordance with ASTM F934.
- PART 3 – EXECUTION**
- 3.01 PREPARATION**
All new installation shall be laid out by the contractor in accordance with the construction plan.
- 3.02 INSTALLATION**
Install chain link fence in accordance with ASTM F567. For chain link tennis court fences, install in accordance with ASTM F969. Fence posts shall be set at spacings of a maximum of 10' o.c. Gate posts shall be spaced according to the gate openings specified in the construction plans. The “Paving and Surfacing,” “Cast-In-Place Concrete” and “Unit Masonry” sections of this specification shall govern post base placement and material requirements. Install fabric on security side and attach with wire ties or clip to line posts at 15 inches o.c. and to rails, braces and tension wire at 24 inches o.c.
- 3.03 CLEANING**
The contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from posts.

TABLE 1

Fence Industry	Decimal O.D. Equivalent		Pipe Wall Thickness		Weight		Section Modulus Inches	Min. Yield Strength psi	Max. Bending Moment lb. in.	Calculated Load (lbs.)		
	O.D. Inches	(mm)	Inches	(mm)	lb./ft.	(kg/m)				10' Free Supported	Cantilever	
1-3/8"	1.315	33.40	.080	2.03	1.06	1.57	.0900	x 50,000	= 4,500	150	N/A	N/A
1-5/8"	1.660	42.16	.085	2.16	1.43	2.13	.1574	x 50,000	= 7,870	262	164	109
2"	1.900	48.26	.090	2.29	1.74	2.59	.2208	x 50,000	= 11,040	N/A	230	154
2-1/2"	2.375	60.33	.095	2.41	2.32	3.45	.3734	x 50,000	= 18,670	N/A	389	259
3"	2.875	73.03	.111	2.82	3.26	4.85	.6365	x 50,000	= 31,825	N/A	663	442

TABLE 2

Finished Gauge	Finished OD (NOM)	Core Diameter (NOM)	PVC Coating Thickness	Mesh Sizes Available	Fabric Extrusion Type	Minimum Breaking Strength
8	.162 (4.11 mm)	.120 (3.05 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1 (25 mm)	CLASS 1, 2A	850#
9	.148 (3.76 mm)	.097 (2.46 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1-1/4 (32 mm); 1 (25 mm)	CLASS 1, 2A	650#

**CONSTRUCTION SPECIFICATION FOR CHAIN LINK FENCE, INDUSTRIAL, COLOR
UTILIZING AMERISTAR® PERMACOAT® PC-40™ FENCE PIPE**

PART 1 – GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the color chain link fencing system defined herein at ([specify project site](#)).

1.02 RELATED WORK

Section 02500 – Paving and Surfacing
Section 03300 – Case-In-Place Concrete
Section 04200 – Unit Masonry

1.03 SYSTEM DESCRIPTION

The contractor shall supply a total color chain link fencing system of the design, style and strength defined herein. The system shall include all components (i.e., framework, chain link fabric, gates and fittings) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

A. American Society for Testing and Materials (ASTM) Standards: A90/A90M - Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings. A653/A653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. A924/A924M - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process. B6 - Specification for Zinc. B117 - Practice for Operating Salt Spray (Fog) Apparatus. D1499 - Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics. D3359 - Test Methods for Measuring Adhesion by Tape Test. E8/E8M - Test Methods for Tension Testing of Metallic Materials. F567 - Practice for Installation of Chain-Link Fence. F626 - Specification for Fence Fittings. F668 - Specification for Poly (Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric. F900 - Specification for Industrial and Commercial Swing Gates. F934 - Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials. F969 - Practice for Construction of Chain-Link Tennis Court Fence. F1043 - Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework. F1184 - Specification for Industrial and Commercial Horizontal Slide Gates.

B. American Association of State Highway and Transportation Officials (AASHTO) Standards: M181 - Standard Specification for Chain-Link Fence.

C. United States Federal Supply Service General Services Administration Specifications: RR-F-191/3 - Federal Specification Sheet for Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) - Detail Specification.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

Framework for color chain link fence systems shall

conform to Ameristar® PermaCoat® PC-40™ Fence Pipe (industrial weight), as manufactured by Ameristar® Fence Products in Tulsa, Oklahoma.

2.02 MATERIAL – STEEL FRAMEWORK

A. The steel material used to manufacture Ameristar® PermaCoat® PC-40™ Fence Pipe 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 (external and internal) of ASTM F1043, Type B.

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 1C, 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. The manufactured framework shall be subjected to the PermaCoat® process, a complete thermal stratification coating process (multi-stage, high-temperature, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish.

F. The material used for the base coat shall be a (gray color) thermosetting epoxy; the minimum thickness of the base coat shall be two (2) mils. The material used for the finish coat shall be a thermosetting "no-mar" TGIC polyester powder; the minimum thickness of the finish coat shall be two (2) mils. The stratification coated pipe shall demonstrate the ability to endure a salt-spray resistance test in accordance with ASTM B117 without loss of adhesion for a minimum exposure time of 3,500 hours. Additionally, the coated pipe shall demonstrate the ability to withstand exposure in a weather-ometer apparatus for 1,000 hours without failure in accordance with ASTM D1499 and to show satisfactory adhesion when subjected to the cross-hatch test, Method B, in ASTM D3359. The polyester finish coat shall not crack, blister or split under normal use.

G. The color of all framework shall be ([specify Black, Green or Brown](#)) in accordance with ASTM F934.

H. The strength of Ameristar® PermaCoat® PC-40™ Fence Pipe 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.

2.03 MATERIAL – FENCE FABRIC

A. The material for chain link fence fabric shall be manufactured from galvanized steel wire. The weight of zinc shall meet the requirements of ASTM F668, Table 4. Galvanized wire shall be PVC-coated to meet the requirements of ASTM F668. The class of the fence fabric shall be ([specify Class 1 - Extruded, Class 2A - Extruded and Bonded or Class 2B - Fused and Bonded](#)).

B. Selvage: Top edge ([specify knuckled or twisted](#)) and bottom edge ([specify knuckled or twisted](#)).

C. Color: The coating color for the fence fabric shall be ([specify Black, Green or Brown](#)). Reference ASTM F668 and ASTM F934.

D. Wire Size: The size of the steel wire core shall be ([specify gauge](#)) gauge. (See Table 2); the finished size of the coated wire shall be ([specify gauge](#)) gauge (See Table 2).

E. Height and Mesh Size: The fabric height shall be ([specify height](#)) feet high with a mesh size of ([specify mesh size](#)) inches. (See Table 2).

2.04 MATERIAL – FENCE FITTINGS

The material for fence fittings shall be manufactured to meet the requirements of ASTM F626. The coating for all fittings shall be the same PermaCoat® color coating system required for the framework (see 2.02); the color of all fittings and fasteners shall be ([specify Black, Green or Brown](#)) in accordance with ASTM F934. All fasteners shall be stainless steel.

2.05 MATERIAL – GATES

Swing gates shall be manufactured and coated to meet the requirements of ASTM F900. Slide gates shall be manufactured to meet the requirements of ASTM F1184. The color of all gates shall be ([specify Black, Green or Brown](#)) in accordance with ASTM F934.

PART 3 – EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plan.

3.02 INSTALLATION

Install chain link fence in accordance with ASTM F567. For chain link tennis court fences, install in accordance with ASTM F969. Fence posts shall be set at spacings of a maximum of 10' o.c. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Paving and Surfacing," "Cast-In-Place Concrete" and "Unit Masonry" sections of this specification shall govern post base placement and material requirements. Install fabric on security side and attach with wire ties or clip to line posts at 15 inches o.c. and to rails, braces and tension wire at 24 inches o.c.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from posts.

TABLE 1

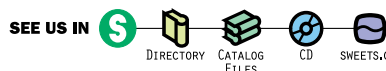
Fence Industry	Decimal O.D. Equivalent		Pipe Wall Thickness		Weight		Section Modulus Inches	x	Min. Yield Strength psi	=	Max. Bending Moment lb. in.	Calculated Load (lbs.)		
	O.D. Inches	(mm)	Inches	(mm)	lb./ft.	(kg/m)						10' Free Supported	Cantilever	
												4'	6'	
1-5/8"	1.660	42.16	.111	2.82	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

TABLE 2

Finished Gauge	Finished OD (NOM)	Core Diameter (NOM)	PVC Coating Thickness	Mesh Sizes Available	Fabric Extrusion Type	Minimum Breaking Strength
6	.192 (4.88 mm)	.148 (3.76 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm)	CLASS 2A	1290#
8	.162 (4.11 mm)	.120 (3.05 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1 (25 mm)	CLASS 1, 2A	850#
9	.148 (3.76 mm)	.120 (3.05 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1 (25 mm)	CLASS 1, 2A	850#

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