

## Schedule 40 Pipe, Galvanized ASTM F1043 Group I-A, Federal specification RR-F-191 Type 1, Grade A, AASHTO M-181 Grade 1

### 1. PRODUCT NAME

Schedule 40 pipe, Galvanized

### 2. DISTRIBUTOR

#### Merchants Metals

Corporate Headquarters:

**Houston, TX 77067**

515 West Greens Road

Phone: (800) 254-0080

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Merchants Metals Service Centers are located throughout the United States.

### 3. PRODUCT DESCRIPTION

#### Basic Use:

Schedule 40 pipe for use as end, corner or line posts, and rails, for commercial, industrial and institutional installations of chain link fencing. Schedule 40 pipe is the historically used material for this purpose. The requirements for this material are contained in various government specifications for use in prison, road, dock, airport, housing, forestry, and military installations.

Schedule 40 pipe is typically used in installations which incorporate zinc-coated or aluminum-coated steel chain link fence fabric, although it may be specified for use with other types of fabric, i.e. PVC coated.

#### Composition and Materials:

Schedule 40 pipe is produced from steel manufactured by the electric furnace, open hearth, or basic oxygen process. The steel is of soft weldable quality.

Welded pipe NPS 4 and under in size may be butt-welded. Welded pipe over NPS 4 is typically electric welded.

#### Standards:

ASTM F1043 *Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework*, Group I-A

ASTM F1083 *Pipe, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures*

ASTM F567 *Installation of Chain Link Fence*

ASTM A 90/A90M *Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles*

Federal specification RR-F-191K/3D *Fencing, Wire and Post Metal (Chain Link Fence Posts, Top Rails, and Braces)*, Class 1, Grade A

AASHTO M-181 *Chain Link Fence*, Grade 1 (American Association of State Highway Transportation Officials)

### 4. TECHNICAL DATA

#### General:

The manufacturer or distributor, if requested, will supply samples and certification that all materials furnished fully comply with the appropriate specifications.

#### Galvanized Steel Framework:

The information contained herein for hot-dipped galvanized welded steel pipe covers the requirements for pipe sizes NPS 1 to NPS 8. (Note: The dimensionless designator NPS is used instead of traditional terms such as nominal diameter, size, and nominal size.)

#### Tensile Requirements:

The **tensile strength** of schedule 40 pipe is 48,000 psi (330 MPa), min.

The yield strength of schedule 40 pipe is 30,000 psi (205 MPa), min.

#### Coating Requirements:

The minimum zinc coating weight of schedule 40 pipe is 1.8 oz/ft<sup>2</sup> (550 g/m<sup>2</sup>), determined from the average results of two specimens taken for test, and not less than 1.6 oz/ft<sup>2</sup> (490 g/m<sup>2</sup>) for either of these specimens. The weight of zinc coating is calculated by dividing the total weight of zinc, inside plus outside, by the total area, inside plus outside, of the area coated.

Schedule 40 pipe with a minimum average zinc coating weight of 2.0 oz/ft<sup>2</sup> (610 g/m<sup>2</sup>) is also available.

Each specimen shall have not less than 1.3 oz/ft<sup>2</sup> (400 g/m<sup>2</sup>) of zinc coating on each surface, calculated by dividing the weight of zinc on a given surface (inside or outside) by the area of the surface coated (inside or outside). The weight of zinc coating is determined in accordance with ASTM A90/A90M.

#### Size and Tolerances:

Sizes of Schedule 40 pipe typically used for fence installations, are listed in **Table 1**.

The weight tolerance of the pipe is  $\pm 10\%$  of the nominal weights listed in **Table 1**.

The tolerance for pipe diameter is 1/64 inch (0.4 mm) over for pipe NPS 1½ and under and 1/32 inch (0.8 mm) under that specified. For pipe size NPS2 and over, the outside diameter shall be  $\pm 1\%$  of that specified.

Pipe mill joint lengths may range from 18 ft to 24 ft, or posts are available cut-to-length. Post lengths must be noted on purchase orders, plans or specifications. The tolerance for cut posts is  $\pm 1$  inch (25.4 mm).

Strength calculations are provided in **Table 2**. The calculations are based on the specified diameters, wall thicknesses, and minimum specified yield strength.

### 5. INSTALLATION

Install fence posts in accordance with ASTM Practice 567.

### 6. AVAILABILITY AND COST

**Availability:** Schedule 40 pipe is available for shipment throughout the United States and worldwide.

**Cost:** Material costs may vary depending on specific requirements. Costs may be obtained through all Merchants Metals Service Centers.

### 7. MAINTENANCE

Periodic inspection is recommended but no routine maintenance is required.

### 8. TECHNICAL SERVICES

Technical services are available through the Merchants Technical Sales Department:

**Phone: (888) 260-1600 (toll free)**  
**FAX: (888) 261-3600 (toll free)**

or your local Merchants Metals Service Center.



## Schedule 40 Pipe, Galvanized

Table 1 – Schedule 40 Pipe – Dimensions and Nominal Weights (plain ends)

Designator		Outside Diameter		Wall Thickness		Weight	
NPS	Metric	inch	mm	inch	mm	lb/ft	kg/m
1	25	1.315	33.4	0.133	3.38	1.68	2.5
1¼	32	1.660	42.2	0.140	3.56	2.27	3.4
1½	40	1.900	48.3	0.145	3.68	2.72	4.0
2	50	2.375	60.3	0.154	3.91	3.65	5.4
2½	65	2.875	73.0	0.203	5.16	5.79	8.6
3	80	3.500	88.9	0.216	5.49	7.58	11.3
3½	90	4.000	101.6	0.226	5.74	9.12	13.6
4	100	4.500	114.3	0.237	6.02	10.80	16.1
6	150	6.625	168.3	0.280	7.11	18.99	28.3
8	200	8.625	219.1	0.322	8.18	28.58	42.5

Table 2 – Schedule 40 Pipe – Strength Characteristics – inch-pound units  
Based on minimum yield strength of 30,000 psi

NPS	Outside Diameter o.d. inches	Wall Thickness inch	Inside Diameter i.d. inches	Section Modulus Inch <sup>2</sup>	Maximum Bending Moment lb-inch	Calculated Load (lbs)		
						10 ft * Free Supported	Cantilever Load **	
							4 ft	6 ft
1	1.315	0.133	1.049	0.133	3,985	133	83	55
1¼	1.660	0.140	1.380	0.235	7,038	235	147	98
1½	1.900	0.145	1.610	0.326	9,786	Sizes above 1.660" o.d. are not normally used for top rail.	204	136
2	2.375	0.154	2.067	0.561	16,819		350	234
2½	2.875	0.203	2.469	1.064	31,921		665	443
3	3.500	0.216	3.068	1.724	51,723		1,078	718
3½	4.000	0.226	3.548	2.394	71,816		1,496	997
4	4.500	0.237	4.026	3.215	96,435		2,009	1,339
6	6.625	0.280	6.065	8.496	254,873		5,310	3,540
8	8.625	0.322	7.981	16.089	504,274	10,506	7,004	

\* 10 ft Free Supported Calculated Load is representative of top rail for a typical chain link fence installation.

\*\* 4 ft and 6 ft Cantilever Loads represent maximum calculated load applied at the top of the post with the bottom fixed.

### Post Selection Guide – based on fabric height

Fabric Height	O. D.		Wall Thickness		Weight	
	in.	mm	in.	mm	lb/ft	Kg/m
Terminal Posts: End, Corner and Pull						
Fabric 6 ft (1,830 mm) and under	2.375	60.3	0.154	3.91	3.65	5.4
Fabric over 6 ft (1,830 mm) to 12 ft (3,660 mm)	2.875	73.0	0.203	5.16	5.79	8.6
<b>Line Posts</b>						
Fabric 6 ft (1,830 mm) and under	1.900	48.3	0.140	3.68	2.72	4.0
Fabric over 6 ft (1,830 mm) to 8 ft (2,440 mm)	2.375	60.3	0.154	3.91	3.65	5.4
Fabric over 8 ft (2,440 mm) to 12 ft (3,660 mm)	2.875	73.0	0.203	5.16	5.79	8.6
<b>Rails (Top, bottom, intermediate and brace)</b>						
All Heights	1.660	42.2	0.140	3.56	2.27	3.4

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