Pipe Hangers and Supports General Specifications

The specifications in this catalogue complies with the engineering principles and standards from Manufacturers' Standardization Society (MSS), and other pertinent documents. The specifications are intended as a guide only, and it is the design engineer's responsibility to use it in conjunction with the data found in this catalogue to determine the best product or products for the user's application.

I. MATERIAL DESIGN AND MANUFACTURE

All pipe hangers and supports shall be manufactured to comply with the latest edition of Manufactures' Standardization Society. Where applicable, design and manufacture of these products should also conform to ANSI/ASME Code for Pressure Piping B31.1.

II. SELECTION

A) STANDARDS

All selection and installation of pipe hangers and supports shall conform to Manufactures' Standardization Society (MSS) SP-58 & SP-69 and other specifications that may apply which are listed in this document.

B) LOAD CALCULATIONS

Pipe hangers, supports, anchors and restraints must be selected to withstand all static and dynamic loading conditions which act upon the piping system and associated equipment. Piping supports and equipment must be considered as a total system and appropriate balance calculations made to determine load forces at critical stress points.

Loading conditions to be considered may include but are not limited to:

1. The total load of pipe, fittings, valves, insulation and any expected contents of the pipe.
2. Thermal expansion and contraction.
3. Stress from cycling of equipment or process.
4. Vibration transmitted to or from equipment or terminal connection.
5. Wind, snow or ice loading on outdoor piping.
6. Loading due to seismic forces if required by code or specification.

C) STRUCTURAL LOADS

Static and dynamic forces at points of attachment must be considered to help ensure structural integrity of buildings or equipment. Pipe hangers and supports must be selected so as to minimize the effect of piping system loading on the structure.

D) MATERIALS

1. Appropriate materials and protective coatings shall be used to prevent failure from environmental and galvanic corrosion.

2. Material that comes in contact with pipe shall be compatible with piping material so that neither has a deteriorating effect on the other.

E) PIPE ATTACHMENTS - HOT SYSTEMS

1. Hot systems are classified as those piping systems that have operating temperatures over 49°C (120°F).

2. Systems with operating temperatures over 232°C (450°F) require special designs for any pipe hangers or supports that are in direct contact with pipe. This is important in determining the raw materials needed as required by Manufactures' Standardization Society (MSS) SP-58 & SP-69.

3. If piping is insulated, the connection of the pipe attachments to the pipe hanger rod shall be outside the insulation so that movement of the line will not cause damage to the insulation.

F) PIPE ATTACHMENTS - AMBIENT SYSTEMS

Ambient systems are classified as those piping systems that have operating temperatures between 16°C (60°F) and 48°C (119°F).

G) PIPE ATTACHMENTS - COLD SYSTEMS

1. Cold systems are classified as those piping systems that have operating temperature below 16°C (60°F).

2. Pipe hangers exposed to temperatures below -40°C (-40°F) require special design by the design engineer.

III. FINISHES

A) ZINC ELECTRO-GALVANIZED (ASTM B633)

This type of coating is recommended for use indoors in relatively dry areas. The steel is submersed in a bath of zinc salts, through the process of electrolysis, a coating of pure zinc adheres to the steel with a molecular bond. A maximum of 0.5 mils of zinc can be applied using this method.

B) PRE-GALVANIZED (ASTM A653)

This type of coating is suitable for extended exposure in dry or mildly corrosive atmospheres but not generally recommended for use outdoors in industrial environments. Also known as "mill galvanized" or "hot-dip mill galvanized". Pre-Galvanized coatings are produced by rolling the steel coils or sheets through molten zinc, at the steel mill, the material is then cut or slit to size. Coating thickness is 0.90 ounces per square foot of steel surface. Zinc near the uncoated edges or weld areas becomes a sacrificial anode which protects the bare areas.

C) HOT-DIP GALVANIZED (ASTM A123/A153)

Recommended for prolonged outdoor exposure and will usually protect steel in most atmospheric environments. After fabrication the part is immersed in a bath of molten zinc. A metallurgical bond is formed resulting in a zinc coating that coats all surfaces including edges. Please note that some items cannot be hot-dip galvanized due to design, tolerances or threaded components. Threaded components on hot-dip galvanized products will be zinc electro-galvanized.

D) EPOXY COATING

Designed for use with copper tubing. This coating provides a superior level of corrosion protection compared to the traditional copper plating finish. It also insulates against dissimilar metal contact, thus preventing electrolysis. During the coating process, the parts are zinc plated to a thickness of 0.0002 inches, the copper or black color epoxy powder is applied by an electrostatic method, then the coated parts are baked at 82°C for 20 minutes.

E) COPPER PLATING

This coating is designed for copper tubing installations. The coating is intended to identify the product size only. This finish is not intended for corrosion resistance.

F) PVC COATING

PVC coating helps reduce noise and protect the pipe or tubing from the metal surface of the hanger. Corrosion resistance protection is minimal.

IV. NOTE

All dimensions are in inches unless otherwise noted.

Technical Data

Schedule 40 Steel Pipe Data

Nominal Pipe Size	Pipe O.D.	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)	Maximum Span (ft.)	Recommended Hanger Rod Sizes
3/8	0.675	0.091	0.6	0.7	7’	3/8-16
1/2	0.84	0.109	0.8	0.9	7’	3/8-16
3/4	1.05	0.113	1.1	1.3	7’	3/8-16
1	1.315	0.133	1.7	2.1	7’	3/8-16
1 1/4	1.66	0.14	2.3	2.9	7’	3/8-16
1 1/2	1.9	0.145	2.7	3.6	9’	3/8-16
2	2.375	0.154	3.6	5.0	10’	3/8-16
2 1/2	2.875	0.203	5.8	7.9	11’	1/2-13
3	3.5	0.216	7.6	10.8	12’	1/2-13
3 1/2	4.0	0.226	9.1	13.4	13’	1/2-13
4	4.5	0.237	10.8	16.3	14’	5/8-11
5	5.563	0.258	14.6	23.2	16’	5/8-11
6	6.625	0.28	19.0	31.5	17’	3/4-10
8	8.625	0.322	28.5	50.1	19’	3/410
10	10.75	0.365	40.5	74.6	22’	7/8-9
12	12.75	0.406	51.1	102.1	23’	7/8-9
14	14.0	0.437	63.0	121.5	25’	1-8
16	16.0	0.50	83.0	159.5	27’	1-8
18	18.0	0.563	105.0	202.2	28’	1-8
20	20.0	0.539	123.0	243.4	30’	1 1/4-7
24	24.0	0.687	171.0	345.2	32’	1 1/4-7

All dimensions are in inches unless otherwise noted.

Schedule 80 Steel Pipe Data

Nominal Pipe Size	Pipe O.D.	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)	Maximum Span (ft.)	Recommended Hanger Rod Sizes
3/8	0.675	0.126	0.7	0.8	7’	3/8-16
1/2	0.84	0.147	1.1	1.2	7’	3/8-16
3/4	1.05	0.154	1.5	1.7	7’	3/8-16
1	1.315	0.179	2.2	2.5	7’	3/8-16
1 1/4	1.66	0.191	3.0	3.5	7’	3/8-16
1 1/2	1.90	2.00	3.6	4.3	9’	3/8-16
2	2.375	0.218	5.0	6.3	10’	3/8-16
2 1/2	2.875	0.276	7.6	9.4	11’	1/2-13
3	3.50	0.30	10.2	13.0	12’	1/2-13
3 1/2	4.00	0.318	12.5	16.3	13’	1/2-13
4	4.50	0.337	15.0	20.0	14’	5/8-11
5	5.563	0.375	20.8	28.7	16’	5/8-11
6	6.625	0.432	28.6	39.9	17’	3/4-10
8	8.625	0.50	43.4	63.1	19’	3/4-10
10	10.75	0.593	64.4	95.5	22’	7/8-9
12	12.75	0.687	88.6	132.6	23’	7/8-9
14	14.00	0.75	107.0	158.2	25’	1-8
16	16.00	0.843	137.0	206.7	27’	1-8
18	18.00	0.937	171.0	259.5	28’	1-8
20	20.00	1.031	209.0	318.4	30’	1 1/4-7
24	24.00	1.218	297.0	455.2	32’	1 1/4-7

All dimensions are in inches unless otherwise noted.

AWWA Ductile Iron Pipe Data

Nominal Pipe Size	Class	O.D. of Ductile Iron Pipe	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)
3	53	3.96	0.31	11.2	15.0
4	53	4.80	0.32	14.2	20.1
6	53	6.90	0.34	22.0	35.1
8	53	9.05	0.36	31.0	54.0
10	53	11.10	0.38	40.4	76.8
12	53	13.20	0.40	50.7	103.0
14	53	15.30	0.42	62.4	133.5
16	53	17.40	0.43	72.8	165.9
18	53	19.50	0.44	83.6	201.5
20	53	21.60	0.45	95.2	241.0
24	53	25.80	0.47	119.2	329.4
30	53	32.00	0.51	161.3	487.8
36	53	38.30	0.58	219.5	688.8
42	53	44.50	0.65	285.2	920.1
48	53	50.80	0.72	360.3	1189.2
54	53	57.10	0.81	455.0	1502.2

All dimensions are in inches unless otherwise noted.

Copper Tubing (Type L) Data

Nominal Tubing Size	O.D. Size	Wall Thickness	Weight of Tubing (lbs./ft.)	Weight of Tubing Filled with Water (lbs./ft.)
1/4	0.375	0.03	0.12	0.15
3/8	0.50	0.035	0.20	0.26
1/2	0.625	0.04	028	0.38
5/8	0.75	0.042	0.36	0.51
3/4	0.875	0.045	0.45	0.66
1	1.125	0.05	0.65	1.01
1 1/4	1.375	0.055	0.88	1.42
1 1/2	1.625	0.06	1.14	1.91
2	2.125	0.07	1.75	3.09
2 1/2	2.625	0.08	2.48	4.54
3	3.125	0.09	3.33	6.28
3 1/2	3.625	0.10	4.29	8.28
4	4.125	0.11	5.38	10.57
5	5.125	0.125	7.61	15.69
6	6.125	0.14	10.20	21.81
8	8.125	0.20	19.29	39.49

Copper Tubing (Type K) Data

Nominal Tubing Size	O.D. Size	Wall Thickness	Weight of Tubing (lbs./ft.)	Weight of Tubing Filled with Water (lbs./ft.)
1/4	0.375	0.035	0.14	0.17
3/8	0.50	0.049	0.27	0.32
1/2	0.625	0.049	0.34	0.43
5/8	0.75	0.049	0.42	0.56
3/4	0.875	0.065	0.64	0.83
1	1.125	0.065	0.84	1.18
1 1/4	1.375	0.065	1.04	1.57
1 1/2	1.625	0.072	1.36	2.10
2	2.125	0.083	2.06	3.37
2 1/2	2.625	0.095	2.92	4.92
3	3.125	0.109	4.00	6.92
3 1/2	3.625	0.12	5.12	9.02
4	4.125	0.134	6.51	11.57
5	5.125	0.16	9.67	17.67
6	6.125	0.192	13.87	25.07
8	8.125	0.271	25.90	45.40

All dimensions are in inches unless otherwise noted.

Recommended Hanger Spacing and Rod Size for Copper Tubing

Nominal Tubing Size	Maximum Span (ft.)	Recommended Hanger Rod Size
1/2	5’	3/8-16
3/4	5’	3/8-16
1	6’	3/8-16
1 1/4	7’	3/8-16
1 1/2	8’	3/8-16
2	8’	3/8-16
2 1/2	9’	1/2-13
3	10’	1/2-13
3 1/2	11’	1/2-13
4	12’	1/2-13
5	13’	1/2-13
6	14’	5/8-11
8	16’	3/4-10

Regular Schedule Glass Pipe Data

Nominal Pipe Size	O.D. Size	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)
1 1/2	1.84	0.12	0.6	1.5
2	2.34	0.14	0.9	2.3
3	3.41	0.17	1.6	4.8
4	4.53	0.20	2.6	8.4
6	6.66	0.24	4.7	17.5

Heavy Schedule Glass Pipe Data

Nominal Pipe Size	O.D. Size	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)
1	1.31	0.16	0.6	0.9
1 1/2	1.84	0.17	0.8	1.5
2	2.34	0.17	1.1	2.4
3	3.41	0.20	2,0	5,0
4	4.53	0.26	3.4	8.8
6	6.66	0.33	6.3	18.7

All dimensions are in inches unless otherwise noted.

Schedule 40 PVC Plastic Pipe Data

Nominal Pipe Size	Pipe O.D.	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)
1/8	0.405	0.068	0.04	0.06
1/4	0.54	0.088	0.07	0.11
3/8	0.675	0.091	0.10	0.18
1/2	0.84	0.109	0.15	0.25
3/4	1.05	0.113	0.20	0.40
1	1.315	0.133	0.30	0.70
1 1/4	1.66	0.14	0.40	1.00
1 1/2	1.90	0.145	0.50	1.40
2	2.375	0.154	0.60	2.00
2 1/2	2.875	0.203	1.00	3.10
3	3.50	0.216	1.30	4.50
3 1/2	4.00	0.226	1.60	5.90
4	4.50	0.237	1.90	7.40
5	5.563	0.258	2.80	11.40
6	6.625	0.28	3.30	15.40
8	8.625	0.322	5.30	26.90
10	10.75	0.366	7.50	41.60
12	12.75	0.406	10.00	58.50

Schedule 80 PVC Plastic Pipe Data

Nominal Pipe Size	Pipe O.D.	Wall Thickness	Weight of Pipe (lbs./ft.)	Weight of Pipe Filled with Water (lbs./ft.)
1/8	0.405	0.095	0.05	0.06
1/4	0.54	0.119	0.09	0.12
3/8	0.675	0.126	0.10	0.16
1/2	0.84	0.147	0.10	0.20
3/4	1.05	0.154	0.20	0.40
1	1.315	0.179	0.40	0.70
1 1/4	1.66	0.191	0.50	1.00
1 1/2	1.90	0.20	0.60	1.30
2	2.375	0.218	0.90	2.20
2 1/2	2.875	0.276	1.30	3.10
3	3.50	0.30	1.80	4.60
3 1/2	4.00	0.318	2.20	6.00
4	4.50	0.337	2.60	7.60
5	5.563	0.375	4.10	12.00
6	6.625	0.432	5.00	16.30
8	8.625	0.50	8.00	27.80
10	10.75	0.593	11.90	43.20
12	12.75	0.687	16.30	60.30

All dimensions are in inches unless otherwise noted.

Spacing of Hangers for Schedule 40 PVC Plastic Pipe Data

Temperature	Support Spacing in Feet for Pipe Size of						
	1/2 to 3/4	1 to 1 1/4	1 1/2 to 2	2 1/2	3	4	6
-7°C (20°F)	5.00	5.50	5.80	6.66	6.80	7.33	7.80
4°C (40°F)	4.75	5.25	5.50	6.33	6.50	7.00	7.50
16°C (60°F)	4.50	5.00	5.25	6.00	6.25	6.50	7.00
27°C (80°F)	4.25	4.66	5.00	5.50	5.80	6.25	6.80
38°C (100°F)	4.00	4.33	4.66	5.25	5.50	5.80	6.33
43°C (110°F)	3.75	4.00	4.33	4.80	5.25	5.50	5.80
49°C (120°F)	3.33	3.75	3.80	4.50	4.75	5.00	5.33
54°C (130°F)	3.00	3.33	3.50	4.00	4.25	4.50	4.80
60°C (140°F)	2.66	2.80	3.00	3.50	3.66	3.80	4.25
66°C (150°F)	2.00	2.25	2.50	2.80	3.00	3.25	3.50

Spacing of Hangers for Schedule 80 PVC Plastic Pipe Data

Temperature	Support Spacing in Feet for Pipe Size of							
	1/2 to 3/4	1	1 1/4 to 1 1/2	2	2 1/2	3	4	6
-7°C (20°F)	5.75	6.33	6.66	7.00	7.80	8.20	8.66	9.80
4°C (40°F)	5.50	6.00	6.33	6.50	7.50	7.75	8.25	9.33
16°C (60°F)	5.25	5.75	6.00	6.25	7.00	7.33	7.80	8.80
27°C (80°F)	4.80	5.33	5.66	6.00	6.66	7.00	7.33	8.33
38°C (100°F)	4.50	5.00	5.25	5.50	6.33	6.50	6.80	7.80
43°C (110°F)	4.33	4.60	4.80	5.12	5.80	6.00	6.33	7.33
49°C (120°F)	3.80	4.33	4.50	4.75	5.33	5.50	5.80	6.50
54°C (130°F)	3.50	3.80	4.00	4.33	4.75	5.00	5.25	6.00
60°C (140°F)	3.00	3.33	3.50	3.66	4.25	4.33	4.66	5.12
66°C (150°F)	2.50	2.75	3.00	3.12	3.33	3.50	3.75	4.25

All dimensions are in inches unless otherwise noted.

Rod Size as Determined by Steel Pipe Size for Fire Protection

Steel Pipe Size	Maximum Span (ft.)	Rod Size
1 to 1 1/4	12’	3/8-16
1 1/2 to 4	15’	3/8-16
5 to 8	15’	1/2-13
10 to 12	15’	5/8-11

Rod Size as Determined by Copper Tubing Size for Fire Protection

Copper Tubing Size	Maximum Span (ft.)	Rod Size
3/4 to 1	8’	3/8-16
1 1/4 to 1 1/2	15’	3/8-16
2 to 3	15’	3/8-16
3 1/4 to 4	15’	3/8-16
5 to 8	15’	1/2-13

Hanger Rod Load Capacities – Hot Rolled Steel Rod

Rod Dia.	Max. Rated Load (lbs.)	Root Area	Weight per Foot (lbs.)	Nominal Pipe Size
3/8	610	0.068	0.376	1/2 to 2
1/2	1130	0.126	0.668	2 1/2 to 3
5/8	1810	0.202	1.04	4 to 5
3/4	2710	0.302	1.50	6 to 8
7/8	4960	0.552	2.67	10 to 18
1 1/8	8000	0.889	4.17	20 to 24

All dimensions are in inches unless otherwise noted.