



SECURITY CONTRACTOR SERVICES

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SCS Fence Metals Spec Tech

Zinc Coated Framework-CR-40

**ASTM F1043 Group IC Federal specification RR-F-191 Class 1
Grade B, AASHTO M-181 Grade 2**

1. PRODUCT NAME

Galvanized Framework, CR-40

2. DISTRIBUTOR

Corporate Headquarters: **5339 Jackson St, North Highlands, CA 95660**

Phone:(916)338- 4800

SCS centers are located throughout the West Coast of the United States

3. PRODUCT DESCRIPTION

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

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

Compositions and Materials: CR-40 pipe is manufactured using cold formed steel with a higher yield strength and tensile strength than schedule 40 pipe. The pipe is triple coated to provide and maintain a lustrous appearance in all climates and under the most severe conditions.

Standards:

- ASTM F103 Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework, Group IC Heavy Industrial
- ASTM F567 Installation of Chain Link Fence
- Federal Specification RR-F-191K/3D Fencing, Wire and Post Metal (Chain Link Fence Posts, Top Rails, and Braces), Class 1, Grade 2a
- AASHTO M-181 Chain Link Fence, Grade 2 (American Association of State Highway Transportation Officials), Grade 2
- Federal Aviation Administration AC 150/5370 Item F162

4. TECHNICAL DATA

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

Zinc Coated Steel Framework: The information contained in here for high yield strength/high tensile strength pipe covers the requirements for pipe sizes 1 to NPS 3.5, corresponding to fence industry sizes 1- $\frac{3}{8}$ " to 4" Note: The dimensionless designator, NPS is used instead of traditional terms such as normal diameter, size, and normal size.)

Yield Strength Requirements

The yield strength of CR-40 pipe is 50,000 psi(344MPa), min.

Coating Requirements

The exterior of CR-40 pipe is triple coated, ensuring the pipe will maintain its appearance. The triple coating consists of a metallic coating of zinc, plus a conversion coating and a clear organic film, conforming to ATSM F1043 Type B coating requirements. The interior of the pipe is coated with a zinc rich paint conforming to ATSM F1043 Type D coating requirements. The coating provides a high level of corrosion resistance to the interior of the pipe.

Size and Tolerance

Sizes and other critical physical characteristics of CR-40 pipe typically used for fence installation are listed in **Table 1**. The weight tolerance of the pipe is +/- 5% of the nominal weights listed in **Table 1**. Mill lengths may range from 18 ft to 24ft, or posts are available cut-to-length. Post lengths must be noted on purchase orders, plans or specifications. Strength calculations are provided in **Table 2**. The calculations are based on the specified diameters, wall thickness, and minimum specified yield strength. Strength calculations are in inch-pound units only. Additional information regarding the size of pipe typically used for various heights of fence fabric is found in **Table 3**.

5. INSTALLATION

Install fence posts in accordance with ASTM Practice 567

6. AVAILABILITY AND COSTS

Availability: CR-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 SCS service centers.

7. MAINTENANCE

Periodic inspection is recommended but no routine maintenance is required.

8. TECHNICAL SERVICES

Technical services are available through the SCS Corporate Office:

Phone: (916)338-4200

Fax: (916)338- 1140

Quote: (800)843-7893

Table 1 - CR-40 Pipe - Nominal Dimensions and Weights

| Disignator | | | Outside Diameter | | Wall Thickness | | Weight | |
|----------------|-------|--------|------------------|-------|----------------|------|--------|------|
| Fence Industry | NPS | Metric | Inch | mm | Inch | mm | lb/ft | kg/m |
| 1-3/8 | 1 | 25 | 1.315 | 33.4 | 0.104 | 2.64 | 1.35 | 2.0 |
| 1-5/8 | 1-1/4 | 32 | 1.660 | 42.2 | 0.111 | 2.82 | 1.84 | 2.7 |
| 2 | 1-1/2 | 40 | 1.900 | 48.3 | 0.120 | 3.05 | 2.28 | 3.4 |
| 2-1/2 | 2 | 50 | 2.375 | 60.3 | 0.130 | 3.30 | 3.12 | 4.6 |
| 3 | 2-1/2 | 65 | 2.875 | 73.0 | 0.160 | 4.06 | 4.64 | 6.9 |
| 3-1/2 | 3 | 80 | 3.500 | 88.9 | 0.160 | 4.06 | 5.71 | 8.5 |
| 4 | 3-1/2 | 90 | 4.000 | 101.6 | 0.160 | 4.06 | 6.56 | 9.8 |

Table 2 - CR-40 Pipe - Strength Characteristics - inch/pound units
Based on minimum yield strength of 50,000 psi

| NPS | Outside Diameter o.d. inches | Wall Thickness inches | Inside Diameter i.d. inches | Section Modulus Inch | Maximum Bending Moment lb-inch | 10 ft* Free Supported | 4ft | 6ft |
|-------|------------------------------|-----------------------|-----------------------------|----------------------|--------------------------------|---|-------|-------|
| 1 | 1.315 | 0.104 | 1.107 | 0.111 | 5,555 | 185 | 116 | 77 |
| 1-1/4 | 1.660 | .0.111 | 1.438 | 0.196 | 9,810 | 327 | 204 | 136 |
| 1-1/2 | 1.900 | 0.120 | 1.660 | 0.281 | 14,050 | Sizes above 1,660 o.d. are not normally used for top rail | 293 | 195 |
| 2 | 2.375 | 0.130 | 2.115 | 0.488 | 24,405 | | 508 | 339 |
| 2-1/2 | 2.875 | 0.160 | 2.555 | 0.878 | 43,890 | | 914 | 610 |
| 3 | 3.500 | 0.160 | 3.180 | 1.341 | 67,040 | | 1,397 | 931 |
| 3-1/2 | 4.000 | 0.160 | 3.680 | 1.782 | 89,100 | | 1,856 | 1,237 |

Table 3 - 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 (1,830mm) and under | 2.375 | 60.3 | 0.13 | 3.3 | 3.12 | 4.6 |
| Fabric over 6ft (1,830mm) to 12ft (3,660mm) | 2.875 | 73 | 0.16 | 4.06 | 4.64 | 6.9 |
| Line Posts | | | | | | |
| Fabric 6ft (1,830mm) and under | 1.9 | 48.3 | 0.12 | 3.05 | 2.28 | 3.4 |
| Fabric over 6ft (1,830mm) to 8ft(2,440mm) | 2.375 | 60.3 | 0.13 | 3.3 | 3.12 | 4.6 |
| Fabric over 8ft (2,440mm) to 12ft (3,660mm) | 2.875 | 73 | 0.16 | 4.06 | 4.64 | 6.9 |
| Rails (Top, bottom, intermedite and brace) | | | | | | |
| All Heights | 1.66 | 42.2 | 0.111 | 2.82 | 1.84 | 2.7 |