

# SHADE

BY SUPERIOR RECREATIONAL PRODUCTS

## SHADE STRUCTURE MATERIAL SPECIFICATIONS

### I. FABRIC SPECIFICATIONS

- A. UV shade fabric is made of UV stabilized cloth manufactured by ALNET, or approved equal.
- B. The high density polyethylene material shall be manufactured with tensioned fabric structures in mind.
- C. The fabric knit is to be made using monofilament and tape filler which has a weight of 9.38 to 10.32 oz. sq. yd. Material to be Rachel-knitted to ensure material will not unravel if cut.
- D. Burst strength of 828 lbf (ASTM 3786).
- E. Cloth meets fire resistance tests as follows:
  - Alnet Extra Block: California State Fire Marshall Reg. #F-93501
  - Others: NFPA 701-99 (Test Method 2), ASTM E-84

- F. Fabric Properties:

**Stretch/Stentored**

**Tear Tests (lbs/ft):** WARP 44.8 and WEFT 44

**Burst Tests (lbs ft):** 828

**Fabric Weight (oz/sqFT) Average:** 1.02 to 1.07

**Fabric Width:** 9'-10"

**Roll Length:** 150'

**Roll Size:** 63" x 16.5"

**Weight:** 120 lbs.

**Life Expectancy:** 10 years

**Fading:** Minimum fading after 6 years (Note: 3 years for Red and Yellow)

**Temperature:** -77 degrees

**Maximum Temperature:** +167 degrees

### II. THREAD

- A. Shall be 100% expanded PTFE fiber which carries a 10 year warranty that is high strength and low shrinkage.
- B. Shall have a wide temperature and humidity range.
- C. Abrasion resistant and UV radiation immunity.
- D. Shall be unaffected by non-hydrocarbon based cleaning agents, acid rain, mildew, rot, chlorine, saltwater, and pollution.
- E. Lockstitch thread - 1200 Denier or equal.
- F. Chain stitch thread - 2400 Denier or equal.

### III. STEEL TUBING

- A. All fabricated steel must be in accordance with approved shop drawings and calculations.
- B. All steel is cleaned, degreased or etched to ensure proper adhesion of powder-coat in accordance with manufacturer's specifications.
- C. All Steel used on this project needs to be new and accompanied by the mill certificates if requested. Structural steel tubing up to 5"-7 Gage shall be galvanized per Allied Steel FLO-COAT specifications. Schedule 40 black pipe fabrications shall be sandblasted and primed as described below.
- D. All non-hollow structural shapes comply with ASTM A-36, unless otherwise noted.
- E. All hollow structural steel shapes shall be cold formed HSS ASTM A-53 grade C, unless otherwise noted.
- F. Plate products shall comply with ASTM A-36.

### IV. POWDER COATING & PRIMING

- A. All non-galvanized steel shall be sandblasted and primed prior to powder coating using brown fused aluminum oxide grit and the following primer.
- B. All non-galvanized steel must be coated with rust inhibiting primer prior to applying the powder coat. Primer shall be Marine Grade Cardinal Industrial Finishes Corp. E396 - GR1372 epoxy powder coating semi-gloss smooth zinc rich primer.
- C. Welds shall be primed with rust inhibiting primer prior to applying the powder coat. Primer shall be Marine Grade Cardinal Industrial Finishes Corp E396-GR1372 epoxy powder coating semi-gloss smooth zinc rich primer.
- D. All steel parts shall be coated for rust protection and finished with a minimum 3.5 mil thick UV-inhibited weather resistant powder coating.
- E. Powder used in the powder-coat process shall have the following characteristics:
  - **N.3.1** | Specific Gravity | 1.68+/-0.05
  - **N.3.2** | Theoretical Coverage | 114+/-4 ft. 2/lb/mil
  - **N.3.3** | Mass Loss During Cure | <1%
  - **N.3.4** | Maximum Storage Temperature | 75° F
- F. Powder-coating shall meet the following tests:
  - **ASTM** | Gloss at 60° | 85-95
  - **HOI TM 10.219** | PCI Powder Smoothness | 7
  - **ASTM D2454-91** | Over-Bake Resistance Time | 200%
  - **ASTM D3363-92A** | Pencil Hardness | H-2H
  - **ASTM D2794-93** | Dir/Rev Impact, Gardner | 140/140 in./lbs.
  - **ASTM D3359-95B** | Adhesion, Cross Hatch | 5B PASS
  - **ASTM D522-93A** | Flexibility Mandrel | ¼" Diameter, No Fracture
  - **ASTM B117-95** | Salt Spray | 1,000 Hours
  - **UL DtOV2** | Organic Coating Steel Enclosures, Elect Eq. | Recognized

G. Application Criteria:

- **N.5.1** | Electrostatic Spray Cold | Substrate: 0.032 in. CRS
- **N.5.2** | Cure Schedule | 10 Minutes at 400° F
- **N.5.3** | Pretreatment | Bonderite 1000
- **N.5.4** | Film Thickness | 3.5 Mils

#### **IV. WELDING**

- A. All shop welds shall be executed in accordance with the latest edition of the American Welding Society Specifications.
- B. Welding procedures shall comply in accordance with the AWS D1.1-AWS Structural Welding Code-Steel.
- C. All welds to be performed by a certified welder. All welds shall be continuous where length is not given, unless otherwise shown or noted on drawings.
- D. All welds shall develop the full strength of the weaker member. All welds shall be made using E70xx.035 wire.
- E. Shop connections shall be welded unless noted otherwise. Field connections shall be indicated on the drawings. Field -welded connections are not acceptable.
- F. All fillet welds shall be a minimum of ¼" unless otherwise noted.
- G. All steel shall be welded shut at terminations to prevent internal leakage.
- H. Internal weld sleeving is not acceptable.
- I. On-site welding of any component is not acceptable.

#### **VI. SEWING**

- A. On-site sewing of a fabric will not be accepted.
- B. All corners shall be reinforced with extra non-tear cloth and strap to distribute the load.
- C. The perimeters that contain the cables shall be double lock stitched.

#### **VII. INSTALLATION HARDWARE**

- A. Bolt and fastening hardware shall be determined based on calculated engineering loads.
- B. All bolts shall comply with SAE-J429 (Grade 8) or ASTM A325 (Grade BD). All nuts shall comply with ASTM F-594, alloy Group 1 or 2.
- C. Upon request, Stainless Steel hardware shall comply with ASTM A-304.
- D. 1/4" galvanized wire rope shall be 7x19 strand with a breaking strength of 7,000 lbs. for shades generally under 575 sq. ft. unless requested larger by the customer. For shades over 575 sq. ft., cable shall be 5/16" with a breaking strength of 9,800 lbs. Upon request, 1/4" Stainless Steel wire rope shall be 7x19 strand with a breaking strength of 6,400 lbs. 5/16" Stainless Steel wire rope shall be 7/19 strand with a breaking strength of 9,000 lbs.
- E. All fittings required for proper securing of the cable are hot dipped galvanized.

#### **VIII. CONCRETE**

- A. Concrete work shall be executed in accordance with the latest edition of American Concrete Building Code ACI 318 unless specified by the governing municipality.
- B. Concrete specifications shall comply in accordance with, and detailed as per plans as follows:
  - 1. 28 Days Strength  $F'c = 2500$  psi
  - 2. Aggregate: HR
  - 3. Slump: 3-5
  - 4. Portland Cement shall conform to C-150
  - 5. Aggregate shall conform to ASTM C-33
- C. All reinforcement shall conform to ASTM A-615 grade 60.
- D. Reinforcing steel shall be detailed, fabricated and placed in accordance with the latest ACI Detailing Manual and manual of Standard Practice
- E. Whenever daily ambient temperatures are below 80 degrees Fahrenheit, the contractor may have mix accelerators and hot water added at the batch plant (See Table 1).
- F. The contractor shall not pour any concrete when daily ambient temperature is below 55° F.

Temperature Range	% Accelerator	Type Accelerator
75-80°	1%	High Early (Non-Calcium)
70-75°	2%	High Early (Non-Calcium)
Below 70°	3%	High Early (Non-Calcium)

## IX. FOOTINGS

- A. All anchor bolts set in new concrete shall be ASTM A-307, or ASTM F-1554 if specified by engineer.
- B. All anchor bolts shall be zinc plated unless specified otherwise.
- C. Footing shall be placed in accordance with and conform to engineered specifications and drawings.