

Playground Equipment Designs

It is the opinion of the manufacturer that playground equipment designs are developed in compliance with the most recent published edition of the following safety standards:

- CAN/CSA-Z614 Children's PlaySpaces and Equipment
- ASTM F 1487 Standard Consumer Safety Performance Specification for Playground Equipment for Public Use
- U.S. Consumer Product Safety Commission (CPSC) Handbook for Public Playground Safety
- Americans with Disabilities Act (ADA) accessibility standards

Uprights

PlaySteel® vertical uprights for PlaySteel® Max are 5" (127mm) x 11 gauge (3mm), PlaySteel® Squared are 4" (102mm) square x 11 gauge (3mm), PlaySteel® Fit are 3.5" (89mm) x 13 gauge (2.3mm), PlayTots™ are 2.5" square x 11 gauge. Outer surfaces are zinc-plated and inner surfaces are treated to resist corrosion. All posts are powder-coat painted. All PlaySteel® post caps are alloy 319 cast aluminum with 0.1875" (5mm) top thickness, 0.125" (3mm) side thickness, and 0.34375" (9mm) corner thickness. Post caps are secured to posts with 10 gauge (3mm) satin-coated steel sheet brackets and mechanical fasteners. Post caps are powder-coat painted to match posts unless otherwise requested.

Steel Components

Steel tube components are Allied Flo-Coat® galvanized steel tube with 0.6 mil (0.015mm) zinc coating and 0.5 mil (0.013mm) internal corrosion coating. Steel tube components comply with ASTM standards A-500 or A-513. All other steel is zinc-coated, hot-dipped galvanized, Plastisol-coated, or powder-coat painted, as specified. Steel tube components contain between 30% and 100% recycled content. Steel tube components are 95-98% recyclable.

Hot Rolled Metal

Hot rolled metal is 13 gauge perforated steel used on Polis Street Furnishings and Park Amenities. Hot rolled perforated metal are totally encapsulated with either plastisol or polyethylene coatings. Hot rolled steel provides better adhesion characteristics for such coatings.

Engineering Properties

- Young's Modulus of Elasticity 200 x 106 MPa at 20°C
- Density 7.87 g/cm³ at 20°C
- Coefficient of Thermal Expansion Low-Carbon/HSLA:
- 12.4 µm/m/°C in 20°C to 100°C range I-F Steel: 12.9 µm/m/°C in 20°C to 100°C range
- Thermal Conductivity Low-Carbon/HSLA: 89 W/m°C at 20°C
- I-F Steel: 93 W/m°C at 20°C
- Specific Heat 481 J/kg/°C in 50°C to 100°C range
- Electrical Resistivity 0.142 µΩm at 20°C

Decks

PlaySteel® decks are a welded assembly of 12 gauge perforated sheet steel. Entire assembly PVC Coating (Poly-Vinyl Chloride) to a depth of 0.085-.150 in (2.159-3.81mm). Decks are pre-punched to receive components.

Metal Preparation for Powder Coat Paint Finish

Metal preparation for powder coat paint finish consists of sandblasting. Parts are free of excess weld splatter.

Zinc Powder Coating

All welded and metal cut or fabricated parts are treated with a in-line zinc rich powder coated primer prior to receiving a powder coat painted finish.

Powder-Coat Paint Finish

Polyester dry powder-coating is electrostatically applied and oven cured at 400°F (200°C). Finished membrane is 3-5 mil (0.076-0.127mm) and includes additives for resistance to ultraviolet (U.V.) degradation. Finished membrane complies with the following performance standards:

- ASTM D 522 (Mandrel Bending)
- ASTM D 2794-90 (Impact)
- ASTM B 117-90 (Salt Spray Resistance)
- ASTM D 3359B (Cross Hatch Adhesion)
- ASTM D 2247-87 (Humidity Resistance)
- ASTM D 3363 (Pencil Hardness)
- ASTM D 822 (Weatherability)
- ASTM D 2454 (Overbake Resistance)

Welded Components

Welded components are Canadian Welding Bureau (CWB) certified under CSA standards W47.1 Div. 2.1 and W47.2 Div. 2.1.

PVC Coating

A. PVC Coating (Poly-Vinyl Chloride): Prior to the application of PVC, all parts are cleaned with a state-of-the-art 6-stage wash system which utilizes environmentally safe chemicals and Nanotechnology to provide excellent corrosion resistance and paint adhesion when compared to traditional iron phosphate pretreatment systems. Once parts have passed through a dry off oven, a proprietary heat activated primer is applied. The primer is formulated to molecularly bond with the PVC formulation and provide superior adhesion to the metal substrate. Once the primer has dried, each part is pre-heated to a temperature no less than 350° F and submerged into liquid PVC. Play surfaces and wear surface on site amenities shall have coating thickness of .085-.150 in.

IMPORTANT NOTE: PVC shall comply with the Consumer Product Safety Improvement act of 2008 by having a concentration that does not exceed 0.1% of the following phthalates; DINP, DIDP, DNOP, DEHP, or BBP. This formulation is also free of heavy metals such as Lead and Cadmium.

B. The PVC physical properties shall have no less than:

- Tensile strength of no less than 1500 psi per ASTM 412.
- Elongation of no less than 300% min per ASTM 412.
- Tear strength of no less than 250 lb./in. per ASTM 624.
- Hardness of 70 +/- 5 (Durometer, Shore A) per ASTM 2240.
- PVC formulated to withstand the requirements of outdoor UV exposure
- The material will meet or exceed the requirements of the Federal Safety Standard MVSS 302 and UL 94 HB requirements

Hardware and Fasteners

All hardware and fasteners are stainless steel or otherwise treated to resist corrosion. Hardware and fasteners are tamper resistant unless otherwise specified. All necessary hardware and fasteners are provided.

Rotationally-Moulded Plastic Parts

Rotationally-moulded plastic parts are moulded from linear medium-density polyethylene resin with ultraviolet

(U.V.) light stabilizers and colour moulded in. Rotationally-moulded plastic parts have an average wall thickness ranging from 0.125" (3mm) to 0.375" (10mm), as specified. Rotationally-moulded plastic parts comply with the following performance standards:

- ASTM D 790 (Flex Modulus)
- ASTM D 638 (Tensile Strength)
- ASTM D 648 (Heat Distortion Temperature)
- ARM-STD (Low Temperature Impact)

0.75" (19mm) Sheet Polyethylene Parts

0.75" (19mm) sheet polyethylene parts are stress-relieved high-density polyethylene with ultraviolet (U.V.) light stabilizers and anti-static guard. Sheet polyethylene parts contain maximum 67% recycled content and are 100% recyclable. Materials comply with:

- ASTM D 790 (Flex Modulus)
- ASTM D 638 (Tensile Strength)
- ASTM D 648 (Heat Distortion Temperature)

Recycled Plastic

Recycled plastic is injection moulded 100% solid blended recycled plastic consisting of 96% polyolefins (HDPE/LDPE/PP), 2% PET, 1% PS, and 1% other. Recycled plastic is ultraviolet (U.V.) light resistant, skid resistant when wet, resistant to infestation by borers, and will not leach. Recycled plastic contains no preservatives. Specific gravity is 0.96. Expansion and contraction with 122°F (50°C) temperature variation is 0.3%. Melting point is 374°F (190°C). Compression strength is 1200 to 2400 lb/in² (8274 to 16548 kPa) depending on profile. No absorption, solubility, or evaporation.

0.625" (16mm) Rope

0.625" (16mm) O.D. vandal-resistant, polypropylene-covered, galvanized steel strand fibre-core cable and 0.25" x 1.5" (6mm x 38mm) zinc.

Orbis Arches

Orbis Arches are ø2.375" (60.3mm) x 10 gauge (3mm) Allied Flo-Coat® galvanized steel tube. Outer surfaces are zinc-plated and inner surfaces are treated to resist corrosion. Arches are screwed with 3/8" stainless steel self tapping screws in corresponding location for clamps. All arches are powder coated.

Orbis Clamps

Orbis clamps are cast with the highest grade 356.1 aluminum. The clamps are then drilled with a ø1/2" hole to fit its 3/8" hardware and T-Nut. The Antigravity Clamp uses 3/8-16 x 3.00" tamper resistant hardware with a T-Nut. The Aphelion and Bridge Clamp use 3/8-16 x 3.50" tamper resistant hardware with a T-Nut. All clamps are powder coated.

Post Caps

Post caps are alloy 319 cast aluminum.

Marine Board (Anti-Skid Plastic)

Non Skid Plastic is 0.75" (19mm) anti-skid marine-grade polymer. Non Skid is specially formulated to withstand the rigors of harsh outdoor playground environments. It is UV-stabilized to resist damage and retain its beauty, even after years of direct sunlight. It does not splinter, crack, delaminate, rot, swell, or absorb water. Even under heavy foot traffic on playgrounds, it remains virtually maintenance-free. The color is integrated with the polymer and retains its vibrant appearance.

Materials comply with:

- ASTM D 790 (Flex Modulus)
- ASTM D 638 (Tensile Strength)
- ASTM D 648 (Heat Distortion Temperature)