

METAL

PART ONE: GENERAL

- 1.1 Architectural metals shall be of the best commercial quality and their various forms shall be straight and true. There shall be no scratches, scars or creases, buckles, ripples or chatter marks. Finished surfaces must be suitable for polishing.
- 1.2 Materials shall be selected for surface flatness, smoothness and freedom from surface blemishes when exposed to view in the finished unit. Exposed-to-view surfaces which exhibit pitting, seam marks, roller marks, "oil-canning", stains, discolorations or other imperfections on the finished units will not be acceptable.

2.0 Steel

Steel generally shall be either stainless 18/10/3 chromium nickel -molybdenum (BS Type 316), or shall be low carbon steel with high temperature fused vitreous enamel coating.

Steel tubes shall be solid drawn.

- 2.1 Structural Steel Shapes and Plates: ASTM A 36.
- 2.2 Cold-Rolled Carbon Steel Strips: ASTM A 109.
- 2.3 Cold-Rolled Carbon Steel Sheets: For concealed surfaces, commercial quality, ASTM A 366. For all exposed parts, ASTM A 569 open-hearth, full pickled, annealed stretcher-leveled standard of flatness, furniture steel, free of waves and other defects and/or impurities.
- 2.4 Hot-Rolled Carbon Steel Sheets: Commercial quality, ASTM A 415, may be used for concealed parts only.
- 2.5 Galvanized Carbon Steel Sheets: ASTM A 526, commercial coating class (380 g/sq.m.)
- 2.6 Cold Finished Steel Bars: Cold-finished, carbon steel, ASTM A 108 merchant quality, and best commercial grade.
- 2.7 Hot-Rolled Steel Bars: ASTM A 575 (Merchant Quality) or ASTM A 576 (Special Quality), best commercial grade.

2.8 Steel Tubing: ASTM A 500, cold-rolled steel seamless welded, best commercial grade, not less than 1mm thick.

2.9 Stainless Steel:

- a. Bars: ASTM A 276 annealed, Alloy 18-8, Type 302.
- b. Plates, Sheets and Strips: ASTM A 167, Alloy 18-8, Type 302.
- c. Tubing: ASTM A 269, Alloy 18-8, Type 302.
- d. Finish: No. 8, Mirror.

3.0 Aluminum

Cast aluminum shall be type LM5 or LM6.

Aluminum alloys types H9, N4, N5, and N8 shall also be permitted.

Anodizing shall be carried out to BS 1151: 1972.

3.1 Cast Aluminum: ASTM B 26 or B 108, alloy 214 for natural anodized finish and alloy 43 for color anodized or baked enamel finish. Provide permanent mold castings, free of blemishes, blowholes, fins, crevices and other imperfections.

3.2 Aluminum Sheets, Plates and Extrusions: ASTM B 209 or B 221, suitable alloy and temper for forming, extruding and fabrication requirements, with adequate control, temper and structural characteristics suitable for finishing, as specified.

3.3 Brass/Bronze: Copper Development Association (CDA) controlled alloys as follows:

- a. Sheet and Plate: Muntz metal, alloy 280.
- b. Extrusions: Architectural bronze, alloy 385.
- c. Castings: Alloy 836, series 800 and 900, best suited for color, matching and forming.

4.0 Finishes:

- 4.1 Polished Finish must be M21M34060, with clear wax finish and must comply with CDA designations and match Designer's samples.

Thickness Minimums:

- a. Sheet: 2mm.
- b. Extrusions: 3mm

- 4.2 Polyester finishes shall be electro statically applied as a dry powder and stoved.
- 4.3 Epoxy finishes to metalwork shall be based on 2-part epoxide resins.
- 4.4 All powder coatings to metalwork shall be fused on at high temperatures and shall consist of nylon 11, unplasticized PVC, polythene or cellulose acetate butyrate (CAB).
- 4.5 All other paints, varnish or lacquered finished to metal work shall be shop-applied and stoved.

5.0 Control of Finishes:

Plating and metal finishing shall be performed simultaneously on complete units. Adjacent and similar type units shall be treated in sequence and with a close control of the process so that there will be no apparent variation in finish over the entire project.

In no case will the Designer give consideration to any option where polished chrome or stainless steel finish is specified. An aluminum finish, whether it is anodized, lacquered, enameled or otherwise treated will not be acceptable.

6.0 Samples:

Submit samples, 150mm sq., of each metal finish required. Show each combination of mechanical and chemical treatments to be used on each alloy. When visible variations will occur, samples shall indicate the extremes. Prepare samples on metal of the same alloy and gauge to be used for the work. Show typical welds, fasteners and screws for compatible finish.

7.0 Product Handling:

Store all ornamental metal items under cover and off the ground.

Handle in such a manner so as to protect surfaces and to prevent damage to fabricated pieces, during storage, erection and during construction.

8.0 Protection:

8.1 Protect exposed mechanical finishes by covering with adhesive paper or other suitable covering prior to shipment from the fabrication or finishing shop.

8.2 Protect exposed chemical and electrolytic finishes (including anodic coatings) by spray coating with lacquer to not less than 0.5 mils thick, prior to shipment from the fabrication or finishing shop.

8.3 Remove protective coverings when there is no longer any danger of damage to the ornamental metal work from other work yet to be preformed in the same location. Restore protective coverings, which have been removed or damaged during shipment or installation of the work, if such other work is yet to be performed.

9.0 Chrome Plated Metal:

ASTM B 456, Type SC-2, electro-deposit of copper, nickel and chromium over base metal, with the following minimum plating thickness:

Copper: 0.0063mm
Nickel: 0.013mm
Chromium: 0.00025mm

Polish the base metal and nickel-plated surfaces prior to finish chrome plating so that no lines, pits, ridges or other imperfections are apparent in the finish chrome plated surface.

Polish chrome plated surfaces shall receive a high polish, mirror finish.

No imperfections of chrome plating are permitted, such as rough or orange peel condition, pits, slivers, breaks in the plate, areas or lines buffed through the outer layers of metal,

dullness, inadequate base metal or intermediate plated surface preparation, adhesion, ductility and inadequate coverage at difficult plating areas.

10.0 Ferrous Metal: (Except stainless or chrome plated steel)

Surfaces shall be chemically cleaned and degreased, imperfections shall be removed, surfaces shall be sanded and receive a phosphate pretreatment or rust-inhibitive primer. All surfaces shall then be sanded as required and given a uniform spray or dipped alkyd amine phenolic enamel coating, baked at a temperature of minimum 149 degrees C. (300 degrees F.) For at least 15 minutes, to a dry film thickness of minimum 0.03mm (1.25mils) (not including pretreatment or primer). Enamel shall dry to a non-reflective finish. Provide special colors selected by Designer. Wherever any dents, scratches or other imperfections are found, they shall be filled, sanded smooth and the entire component repainted with the baked enamel finish herein specified.

11.0 Miscellaneous Materials:

- 11.1 Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of the metal to be welded, and as required for color match, strength and compatibility in the fabricated items.
- 11.2 Fasteners: Shall be of basic metal and alloy, matching finished color and texture as the metal being fastened, unless otherwise indicated. Unless otherwise shown, provide Phillips flat-head screws for exposed fasteners.

END OF SECTION