Section 4190. Nonferrous Metals

4190.01 STRUCTURAL ALUMINUM.

Meet requirements specified in the contract documents. Fabricate welds using the metal inert gas (MIG) process, unless the Engineer approves otherwise.

4190.02 ALUMINUM FASTENERS.

Furnish aluminum bolts, nuts, and washers of the size shown in the contract documents. Ensure they meet the following requirements:

A. Bolts.

1. Made from rods meeting requirements of ASTM B 211, Alloy 2024-T4.

2. Unless specified otherwise, hexagonal heads complying with ANSI B18.2.1, except heavy hexagonal heads for bolts for fastening together structural aluminum parts.

3. Threads complying with ANSI B1.1 for Unified Coarse Thread Series, Class 2A fit.

B. Nuts.

1. Manufactured from stock meeting requirements of ASTM B 211, Alloys 6061-T6 or 6262-T9.

2. Unless specified otherwise, hexagonal conforming to ANSI B18.2.2, except heavy hexagonal nuts for fastening together structural aluminum parts.

3. Threads complying with ANSI B1.1 for Unified Coarse Thread Series, Class 2B fit.

4. Self locking nuts of a type and quality approved by the Engineer.

C. Washers.

1. Made from a material of a quality suitable for the intended use and approved by the Engineer.

2. Unless specified otherwise, dimensions meeting the requirements of ASTM F 436.

4190.03 BRONZE BEARING METAL.

A. Furnish bronze bearings of the shape and dimensions shown in the contract documents and meeting the following requirements:

1. Bearing surfaces finished to the degree specified.

2. Bronze metal for plain bearings meeting the requirements of ASTM B 22, Alloy UNS No. C91300 or C91100, or ASTM B 100.

B. When lubricated bronze bearings are specified, furnish bearings meeting the following requirements:

1. Bronze metal meeting the requirements of ASTM B 22, Alloy UNS No. C91300, C91100, or C86300, or ASTM B 100.

2. 24 to 35% of each bearing area to consist of dry lubricating inserts no less than 3/16 inch (5 mm) deep.

3. Dry lubricating inserts that are:

- Arranged in a geometric pattern such that successive rows overlap in the direction of movement and are distributed along the rows so that, in any two adjacent rows, the entire width of the bearing surface will be covered, except 1/4 inch (6 mm) at each margin, and
- Graphite type of lubricant held by a suitable lubricating binder which is firmly compacted into the recess.

C. Comply with the following tolerances:

1. **Sliding surface:** flat within 1/32 inch per foot (3 mm/m) on length or width.

2. **Radial, cylindrical, or spherical sliding surfaces:** not exceeding 0.010 inch (0.254 mm) on the radius.

3. **Convex surfaces:** positive radial tolerance not exceeding 0.010 inch (0.254 mm).