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MATERIAL FOR STEEL PIPE RAILINGS

This is a preview of a section of NAAMM's forthcoming Pipe Railing Manual as appeared in the April 1975 issue of "Architectural Metals."

Both pipe and tubing are made from carbon steel. However, the product which, for commercial reasons, is classified as tubing is manufactured on pipe mills and has the same dimensions and other physical characteristics as pipe.

Traditionally, most steel pipe railings have been made of material conforming to either ASTM A120, "Black and Hot-Dipped Galvanized Welded Seamless Steel Pipe for Ordinary Uses," or ASTM A53, "Welded and Seamless Steel Pipe." But with increasing requirements, especially by government agencies, for railings of higher strength, three newer ASTM specifications have been developed for structural grade welded seamless tubing: A500 (cold-formed carbon steel,) A501 (hot-formed carbon steel) and A168 (hot-formed high strength low alloy steel). A501 is comparable in composition and strength to A36 steel (plate,) and is the structural grade most commonly used.

The A120 specification requires a hydrostatic pressure test, but no chemical or mechanical tests. A53 also requires a hydrostatic test, as well as chemical analysis, tensile testing and a bend or flattening test. The three specifications for structural tubing have limits on chemical composition and mechanical properties but no hydrostatic test.

The grade of product to be specified will depend on the requirements of use, code regulations and the method of fabrication to be used. Both the A120 pipe and the A501 structural tubing can be bent, though difficulties may sometimes be experienced with the latter. A more readily formed product may be obtained by specifying ASTM A53, Grade A.

Connections in architectural railings are normally made by welding, and all of the grades of pipe and tubing mentioned above are readily weldable.

Architectural pipe railings of carbon steel are usually finished by painting in the field, over a shop-applied prime coat, but sometimes a galvanized finish is required. The products are supplied by the mill either as "bare" pipe or "black" pipe. Bare pipe will have varying degrees of rusting, depending on age and storage conditions; black pipe is "oiled" with a protective varnish. The A120 and A501 products are normally supplied with the varnish coating, but for railings bare pipe should be specified. The "oiled" coating not only is unsuitable for bending about an inside mandrel, but greatly increases the cost of galvanizing.

Under current OSHA regulations the welding of galvanized pipe in the field requires the use of a special welding helmet with piped oxygen to protect the welder from breathing zinc fumes. As this makes the process prohibitively expensive, the alternative, when galvanized railing is required, is either hot-dip galvanizing of the railing after fabrication - also an expensive operation with definite size limitations - or the field application of zinc-rich paint as a substitute for true galvanizing.