Advisory Bulletin

BOBRICK
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TB-75 Types of Stainless Steel

Stainless steel is a term covering more than fifty alloys of steel, all with chromium and additives to counteract the rusting of iron, the basic mineral in steel. Many of the stainless varieties are alloyed for specific qualities that are not pertinent to the manufacture of washroom accessories and cabinets. For this purpose, three types are in general use: Type-304, type-302, and type-430.

300 Series: All A. I. S. I. types designated 3 — (S.A.E. numbers 303 - -) contain chromium and nickel. These are the two elements that are deposited on vulnerable metal surfaces by the process of chrome plating. The effect of chromium and nickel together is synergic. In 300 Series steel the corrosion-resistant elements are integral, not just a coating.

Type-302 was generally used until about 20 years ago when type-304, an improved version, was developed. While both are in the nominal 18-8 family, type-304 contains 18-20% chromium while type 302 allowed 17-19%. Nickel is 8-10% in type-302, 8-12% in type-304. Corrosion-resistance is correspondingly stronger in type-304. Further, carbon was reduced from .15% in type-302 to .08% in type-304. Lower carbon content often means that parts can be welded without impairing the corrosion-resistance of the material adjacent to the weld.

400 Series: Washroom equipment is normally A. I. S. I. type-430 (S.A.E. number 51430) that has 14-18% chromium, no nickel at all, and .12% carbon content. Type-430 is more corrosion-prone than type-304, particularly vulnerable at welds. It's only virtue is cost savings to the manufacturer.

Effects of different composition are shown in a Corrosion Guide issued by H. M. Harper Co., rating resistance of various metals and alloys to corrosion from 140 chemicals. Stainless steel types-304 and -302 scored 88 *excellents* and 12 *poors*; Type-430, 66 *excellents* and 30 *poors*. The remaining scores were split into *good* and *fair* ratings, again favoring the 300 Series. Many of the test chemicals are found in cleaning products and air pollutants.

Appearance is identical: the only way to tell type-430 from type-304 is with a magnet. 400 Series is magnetic; 300 Series is not. Testing should be done in an unworked area of the stainless steel because welding, bending, cutting, and shaping operations can impart a weak magnetic field to the immediate area in type-304. In type-430 the magnetism in any area is far stronger; the magnet jumps to the surface.

Manufacturers who cut costs by using 400 Series often put it in such locations as the backs or bottoms of cabinets, door backs, receptacle bottoms, or concealed mounting plates . . . exactly the areas where condensation forms and fluids become trapped. It is these vulnerable areas that specifically should be checked for magnetism.

A washroom accessory fabricated in all type-304 stainless steel can be expected to last for the lifetime of the building and will require little or no special maintenance due to unsightly and weakening corrosion.

For further information on stainless steel maintenance and avoidance of corrosion, see Advisory Bulletin TB-21.

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