Gauge	Thickness (in.)	Weight (oz/sq.ft.)
10	0.1345	90
12	0.1046	70
14	0.0747	50
16	0.0598	40
18	0.0478	32
20	0.0359	24
22	0.0299	20
24	0.0239	16
26	0.0179	12
30	0.0149	10

Figure 7-3 Sheet metal properties.

cavities. Direct chemical attack can be caused by chlorides, and set-accelerating admixtures which contain calcium chloride should not be used in masonry mortar. Deep carbonation of mortar caused by carbon dioxide intrusion through cracks or voids at the mortar-to-unit interface may also accelerate corrosion of metal anchors, ties, or reinforcement embedded in the mortar. Some metal corrosion in masonry is caused by galvanic action. Galvanic action causes corrosion between dissimilar metals in the presence of an electrolyte (such as water).

All steel used in masonry, with the exception of reinforcing bars and wire fabric, should be galvanized or stainless steel. Although zinc is also susceptible to corrosive attack, it is used in the galvanizing process to provide both a barrier coating to isolate the steel from corrosive elements, and a sacrificial anodic coating that is consumed to protect the base steel at uncoated areas such as scratches and cut ends. Although corroded metal occupies a greater volume than the original material and exerts expansive pressures around the embedded item, the film of zinc used to galvanize masonry accessories is so thin that the pressure is insufficient to crack the masonry. If the masonry is absorbing excessive moisture because of design or construction defects, however, corrosion of the steel may continue and the expansive pressures increase substantially over time. As this "rust jacking" continues, the masonry is cracked, allowing even more moisture to enter the wall.

The table in *Fig. 7-4* lists the corrosion protection requirements for masonry accessories found in the Masonry Standards Joint Committee (MSJC) *Specifications for Masonry Structures* (ACI 530.1/ASCE6/TMS 602). Masonry accessories in exterior walls and interior walls exposed to relative humidities of 50% or higher should be hot-dip galvanized after fabrication in accordance with ASTM A153, *Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware,* Class B. Mill galvanizing and electrogalvanizing do not provide protection at sheared edges, wire ends, shop welds, penetrations, and so on. For interior walls exposed to lower humidity, joint reinforcement can be zinc coated in accordance with ASTM A641, *Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire.* The life expectancy of the corrosion protection afforded by galvanizing is directly proportional to its thickness (*see Fig. 7-5*). Stainless steel accessories are less

Masonry Standards Joint Committee Specification for Masonry Structures (ACI 530.1/ ASCE 6/TMS 602) Requirements for Corrosion Protection§

Accessory Item	ASTM Standard†	Class	Weight or Thickness of Coating
Galvanized Coatings			
Joint reinforcement, interior walls	A641	1	0.10 oz/sq.ft.
Wire ties or anchors in exterior walls completely embedded in mortar or grout	A641	3	0.80 oz/sq.ft.
Wire ties or anchors in exterior walls *not* completely embedded in mortar or grout	A153	B2	1.50 oz/sq.ft.
Joint reinforcement in exterior walls or interior walls exposed to a mean relative humidity exceeding 75% (e.g., food processing or swimming pool)	A153	B2	1.50 oz/sq.ft.
Sheet metal ties or anchors in exterior walls or interior walls exposed to a mean relative humidity exceeding 75% (e.g., food processing or swimming pool)	A153	B2	1.50 oz/sq.ft.
Sheet metal ties or anchors in interior walls	A653	G60	0.60 oz/sq.ft.
Steel plates and bars (as applicable to size and form indicated)	A123 A153	— B	— —
Epoxy Coatings			
Joint reinforcement	A884	B2	18 mils
Wire ties and anchors	A899	C	20 mils
Sheet metal ties and anchors	—	—	20 mils‡

§ Corrosion protection may also be provided by using AISI Type 304 stainless steel as follows:
joint reinforcement, ASTM A580 *Stainless and Heat-Resisting Steel Wire*
plate and bent bar anchors, ASTM A666 *Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar for Structural Applications*
sheet metal ties and anchors, ASTM A167 *Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip*
wire ties and anchors, ASTM A580 *for Stainless and Heat-Resisting Steel Wire*

† ASTM A641 *Zinc Coated (Galvanized) Carbon Steel Wire*
ASTM A153 *Zinc Coating (Hot-Dipped) on Iron and Steel Hardware*
ASTM A653 *Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process*
ASTM A884 *Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement*
ASTM A899 *Steel Wire Epoxy Coated*

‡ Per surface or manufacturer's specification.

Figure 7-4 Required corrosion protection for masonry accessories. (*From Masonry Standards Joint Committee,* Specifications for Masonry Structures, *ACI 530.1 ASCE 6/TMS 602.*)

susceptible to corrosion and provide greater long-term durability for masonry construction. Stainless steel will provide the highest corrosion protection in severe exposures, and should conform to Series 300, ASTM A167, *Standard Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.* ASTM Committee C15 on Manufactured Masonry Units is in the process of developing a standard guide for corrosion protection