- *Sinker nails* are bright or coated slender nails with a sinker head and diamond point. The diameter of the head is smaller than that of a common nail with the same designation. Sinker nails are used primarily for rough framing and applications where lumber splitting may be a concern.
- *Box nails* are bright, coated, or galvanized nails with a flat head and diamond point. They are made of lighter-gauge wire than common nails and sinkers and are commonly used for toenailing and many other light framing connections where splitting of lumber is a concern.
- *Cooler nails* are generally similar to the nails above, but with slightly thinner shanks. They are commonly supplied with ring shanks (i.e., annular threads) as a drywall nail.
- *Power-driven nails* (and staples) are produced by a variety of manufacturers for several types of power-driven fasteners. Pneumatic-driven nails and staples are the most popular power-driven fasteners in residential construction. Nails are available in a variety of diameters, lengths, and head styles. The shanks are generally cement-coated and are available with deformed shanks for added capacity. Staples are also available in a variety of wire diameters, crown widths, and leg lengths. Refer to NER-272 for additional information and design data (NES, Inc., 1997).

Nail lengths and weights are denoted by the *penny weight*, which is indicated by *d*. Given the standardization of common nails, sinkers, and cooler nails, the penny weight also denotes a nail's head and shank diameter. For other nail types, sizes are based on the nail's length and diameter. Table 7.2 arrays dimensions for the nails discussed above. The nail length and diameter are key factors in determining the strength of nailed connections in wood framing. The steel yield strength of the nail may also be important for certain shear connections, yet such information is rarely available for a "standard" lot of nails.

TABLE 7.2 Nail Types, Sizes, and Dimensions[1]

Type of Nail	Nominal Size (penny weight, d)	Length (inches)	Diameter (inches)
Common	6d	2	0.113
	8d	2 1/2	0.131
	10d	3	0.148
	12d	3 1/4	0.148
	16d	3 1/2	0.162
	20d	4	0.192
Box	6d	2	0.099
	8d	2 12	0.113
	10d	3	0.128
	12d	3 1/4	0.128
	16d	3 1/2	0.135
Sinker	6d	1 7/8	0.092
	8d	2 3/8	0.113
	10d	2 7/8	0.120
	12d	3 1/8	0.135
	16d	3 1/4	0.148
Pneumatic[2]	6d	1 7/8 to 2	0.092 to 0.113
	8d	2 3/8 to 2 1/2	0.092 to 0.131
	10d	3	0.120 to 0.148
	12d	3 1/4	0.120 to 0.131
	16d	3 1/2	0.131 to 0.162
	20d	4	0.131
Cooler	4d	1 3/8	0.067
	5d	1 5/8	0.080
	6d	1 7/8	0.092

Notes
[1]Based on ASTM F 1667 (ASTM, 1995).
[2]Based on a survey of pneumatic fastener manufacturer data and NER-272 (NES, Inc., 1997).

There are many types of *nail heads*, although three types are most commonly used in residential wood framing.

- The *flat nail head* is the most common head. It is flat and circular, and its top and bearing surfaces are parallel but with slightly rounded edges.
- The *sinker nail head* is slightly smaller in diameter than the flat nail head. It also has a flat top surface; however, the bearing surface of the nail head is angled, allowing the head to be slightly countersunk.
- *Pneumatic nail heads* are available in the above types; however, other head types such as a half-round or D-shaped heads are also common.

The *shank*, as illustrated in Figure 7.1, is the main body of a nail. It extends from the head of the nail to the point. It may be plain or deformed. A plain shank is considered a "smooth" shank, but it may have "grip marks" from the manufacturing process. A deformed shank is most often either threaded or fluted to provide additional withdrawal or pullout resistance. Threads are annular