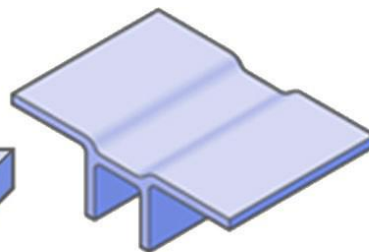
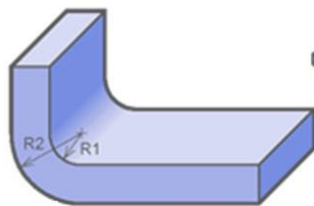
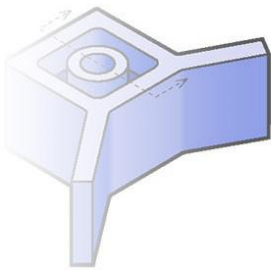


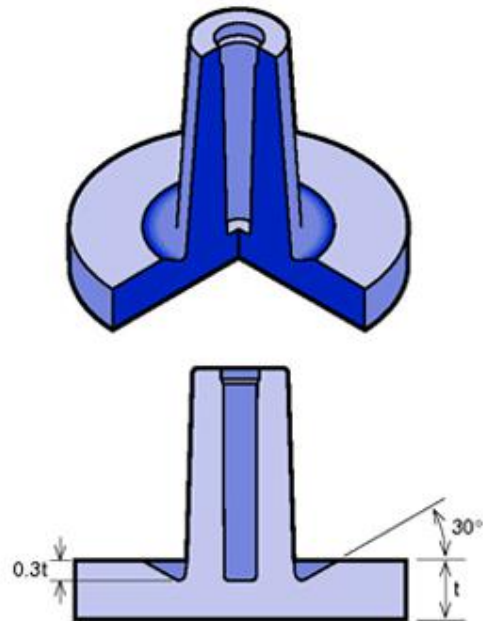
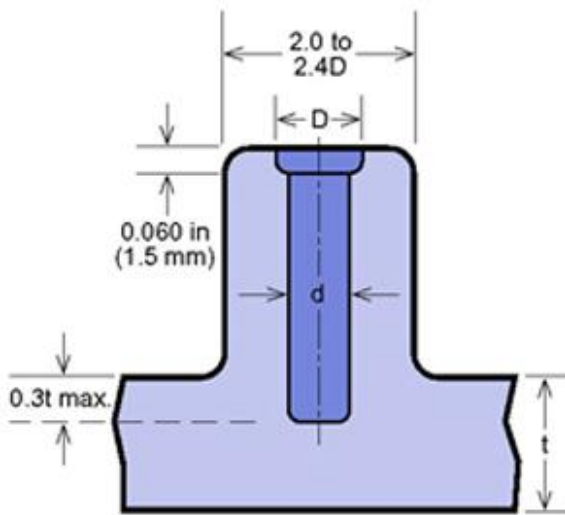
Basic Injection Molding Design Guidelines

SAMPLE



Bosses

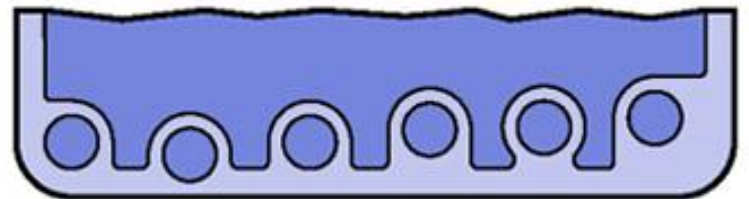
Bosses find use in many part designs as points for attachment and assembly. The most common variety consists of cylindrical projections with holes designed to receive screws, threaded inserts, or other types of fastening hardware. Generally, the outside diameter of bosses should remain within 2.0 to 2.4 times the outside diameter of the screw or insert.



It is suggested avoiding bosses that merge into sidewalls because they can form thick sections that lead to sink. Proper bosses should be positioned away from the sidewall, and if needed, use connecting ribs for support. Try using open boss designs for bosses near a standing wall.

Bosses

Incorrect



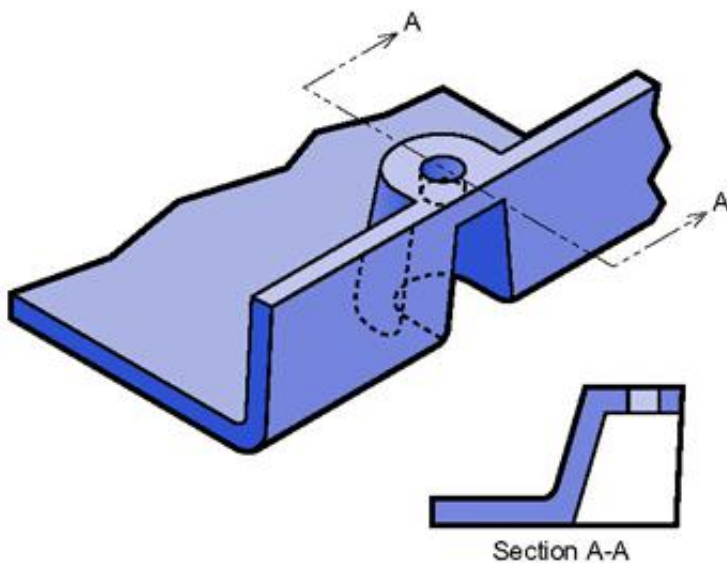
Correct



Bosses — Continued

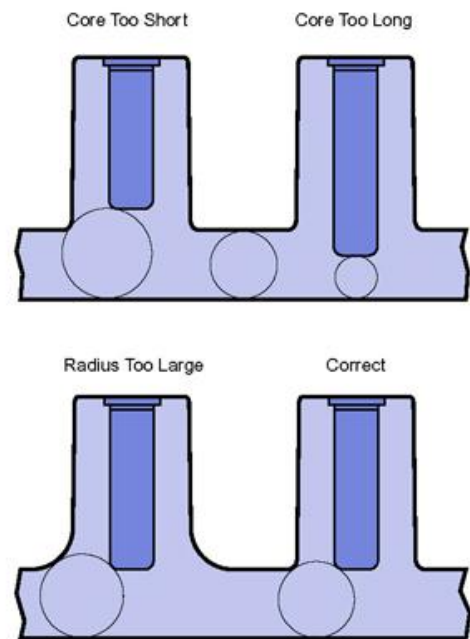
Normally, the boss hole should extend to the base-wall level, even if the full depth is not needed for assembly. Shallower holes can leave thick sections, resulting in sink. Deeper holes reduce the base wall thickness, leading to filling problems, knitlines, or surface blemishes. Because of the required draft, tall bosses (those greater than five times their outside diameter) can create a filling problem at their top or a thick section at their base. Additionally, the cores in tall bosses can be difficult to cool and support. Think about coring a tall boss from two sides or extending tall gussets to the standoff height instead of than the whole boss.

Boss in Attachment Wall



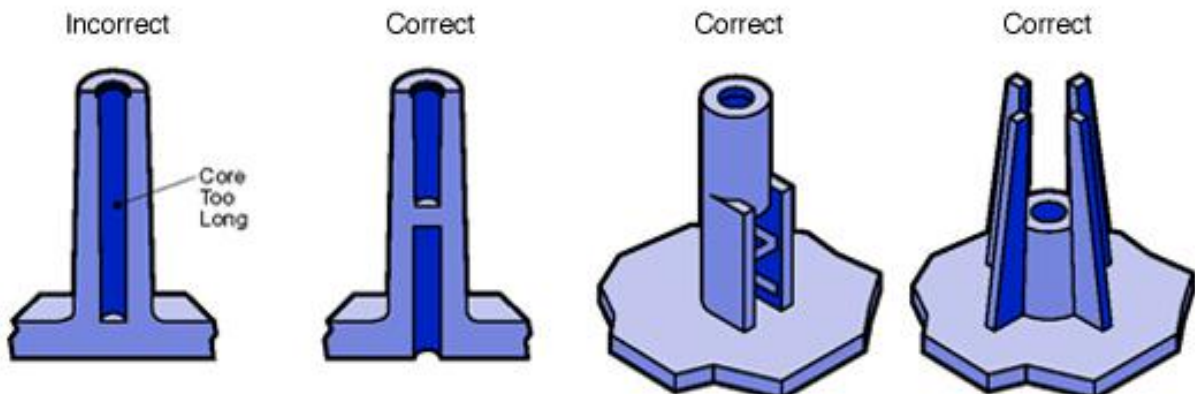
Open bosses maintain uniform thickness in the attached wall

Boss Core Depth



Boss holes should extend to base-wall level.

Long-Core Alternatives



Options to reduce excessively-long core pins.