Zinc Die Casting Improves Miter Gear Strength

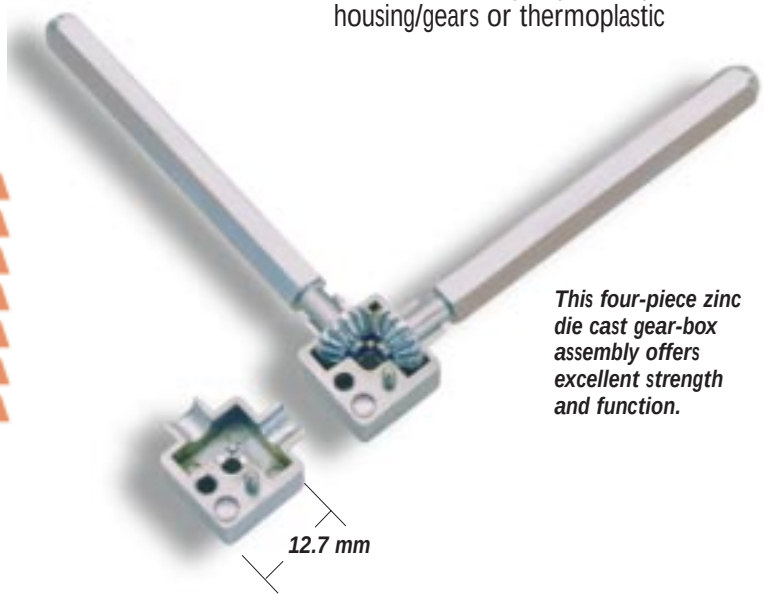
A miter gear assembly used as a tilter requires strength to withstand the rotational torque that opens and closes Venetian blinds. Hunter Douglas Inc. chose zinc die casting and the Zamak 5 alloy for this application.

The tilter translates vertical motion to horizontal motion through a pair of matching miter gears. One end of the tilter is attached to a vertical wand; the other to the horizontal tilt rod in the blind mechanism. The performance requirement states that the wand shall fail (twist and break) before the gear assembly (tooth shear). The zinc die-cast assembly was designed to exceed this requirement.

The Zamak 5 alloy was recommended over Zamak 3, the most popular zinc alloy, specifically for its strength characteristics. A comparison of the two alloys shows that Zamak 5 has superior ultimate (48 ksi v. 41 ksi), shear (38 ksi v. 31 ksi) and fatigue (rotary bend—8.2 ksi v. 6.9 ksi) properties, as well as greater Brinell hardness (19 v. 82).

Both gears and the two-piece housing are die cast net-shape without a cost penalty compared to alternate designs (thermoplastic housing/gears or thermoplastic housing/ metal gears). In addition, this all-metal assembly is perceived by customers as being stronger than plastic/metal assemblies.

This assembly is die cast in-house by Hunter Douglas at its Owensboro, KY facility.



This four-piece zinc die cast gear-box assembly offers excellent strength and function.