Best-In-Class Cast Components: 2008

Earning top recognition from the eighth annual Casting Contest, these components clearly illustrate the benefits the casting process offers to the design and engineering community.

PIAD'S partnership with Nissan Forklift Corporation resulted in the development of a chill-cast "Steering Linkage Assembly." This fab-to-cast conversion showcases a creative design that performs multiple functions within a single part. The assembly is an integral part of the overall operation of a pallet truck for the material handling industry.

This conversion presented PIAD with the challenge of developing a product that would not only accommodate the requirements necessary for accurately steering the vehicle, but one that would also become the focal point of the lifting-hub in the handle mechanism.

This single casting replaces a current weldment that is made up of 10 individual pre-fabricated pieces, 19 weld joints, and 4 bushings. It also eliminated a significant amount of machining, as well as the need for stress relieving.

PIAD'S non-ferrous chill mold castings provided the customer with near net shape configurations that include cast to size holes, bosses, access holes and arc slots. PIAD eliminated the need for machining certain features used for mounting proximity switches, handle return bumpers, pivot shafts, swinging rods, wire harness clips and adjustment cams. Where finishing is required PIAD added a minimal amount of finishing stock (.030"). The excellent repeatability of PIAD'S chill cast process aided with set-up and fixturing issues.

PIAD is able to utilize its process to cast the complex geometry required for an overall design that is unique in shape, facilitates the mounting of additional components, while reducing the overall part weight by 10% .

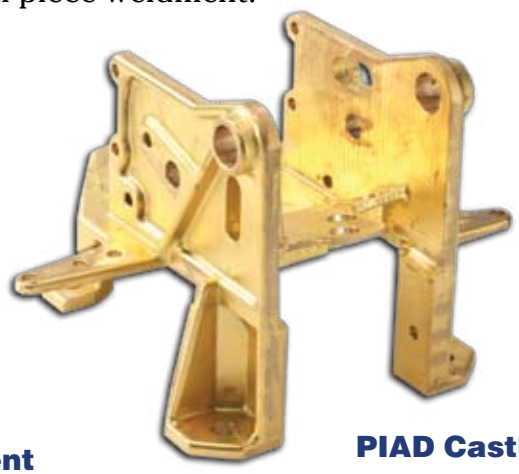
For this project PIAD's alloy S010 was selected. S010 is a high quality special brass which has good mechanical properties and is resistant to corrosion in industrial atmospheres. Because the linkage will see impact and torque forces during everyday use, the increased yield and tensile strengths of S010 allowed PIAD to produce a sound casting with sufficient mechanical integrity. Besides eliminating many components and reducing the labor cost to assemble and weld the various components, the one piece PIAD chill casting simplified the supply chain logistics significantly.

Material Handling Steering/Linkage Assembly

PIAD Precision Casting Corporation, Greensburg, Pennsylvania

Material: Brass.
Process: Permanent mold chill casting.
Weight: 9.82 lbs.
Dimensions: 10 x 8.5 x 6.7 in.
Application: Steering linkage for a pallet truck.
Converted From: Multi-piece weldment.

Multi-Piece Weldment



PIAD Casting