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Investment Casters

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near net-shape casting saves 4.9 hours per part in machine time."

3. Fork Roller for Oil Drilling Pump — Tech Cast Inc. (www.techcastinc.com), Myerstown, PA, managed to "design out" some of the heavier features of this fork roller used in a metal forging operations, which measures 18×16×20 in. The near net shape made it possible to reduce machining, resulting in a component that is lighter than the 260 lb forging it replaces (and which began as a 740-lb block of 15-5 pH stainless steel. It also costs 39% less per finished piece.

4. Anti-Siphon Valve for Commercial Aircraft — Kovatch Castings Inc. (www.kovatchcastings.com), Uniontown, OH, developed this anti-siphon valve in 304L stainless steel for a commercial aircraft manufacturer. It measures 2.7×2×2.25 in., but its complex internal shape demonstrates the complexity of the investment cast parts, which in this case have been achieved without using any coring systems. "The back of the part has three holes," ICI explains, "which allows shell-building material on the internal surfaces of the pattern." Later, the holes are welded closed."

5. Pre-Cooler for Aircraft Engine Vent — Vestshell Inc. (www.vestshell.com/mainpage.htm), a Montreal investment casters, designed and produces this pre-cooler in 410 stainless steel. It measures 7×2×1 in., which displays a complex geometry in a well "constrained" space, which was required in order to deliver a sufficient amount of engine coolant under considerable pressure to a very narrowly defined space. That geometry, and the parts' stable dimensions at higher operating temperatures indicated that aluminum would not be a viable alloy for this application, leaving the choice of stainless steel. Several other processes were considered, too, and rejected, including metal injection molding, weldment, and hogout.