

Modeling swimsuits

Computational fluid dynamics (CFD) software is used by physicists and engineers to analyze problems such as air flow around automobiles or water flow around submarines. Using supercomputers, researchers numerically approximate solutions to the Navier-Stokes equations for fluid motion and use visualization software to determine areas of high friction—for example, on the wing of a fighter jet or along the hull of a yacht racing in the America's Cup.

After the 2000 Summer Olympics

swimwear manufacturer Speedo International Ltd saw potential in CFD analysis to reduce drag in its full-body swimsuit. Speedo tapped the expertise of CFD software maker ANSYS Inc and a Honeywell Corp aerospace engineer who was also a swimming enthusiast. In this computer simulation, streamlines show details of water flow around a swimmer—and his full-body swimsuit—in the glide position. The swimsuit is the new Speedo LZR Racer, which uses hydrophobic, low-drag materials that also compress the swimmer's body and reduce both form drag and skin-friction drag (see the news story on page 32). The fabrics were tested in a low-speed NASA wind tunnel and a swimming flume. In preparation for the 2012 Olympics, Speedo's R&D collaboration is looking to extend CFD analysis to model the drag encountered during a swim stroke. (Image courtesy of ANSYS Inc.)

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