



COMPUTATIONAL FLUID DYNAMICS (CFD): COMPUTATIONAL MODELING FOR PROTECTIVE CLOTHING

OVERVIEW:

NSRDEC developed computational models which are integrated with improved test methods. These models are used to assess the importance of coupled heat and mass transfer, combined convection/diffusion, liquid capillary transport, and concentration-dependent membrane diffusion. Realistic computational fluid dynamic models of the clothed human make it possible to directly examine the system consequences of various material properties or clothing design parameters (closures/fit). CFD software includes ANSYS/Fluent and CFD2000.

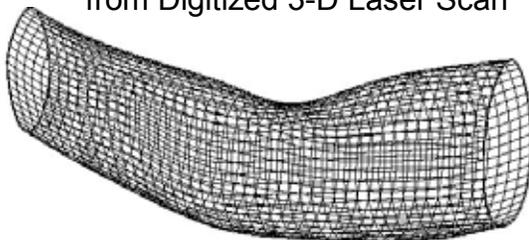
DESCRIPTION:

Creation of "virtual" human thermal/protective clothing model to complement existing manikin/human evaluations

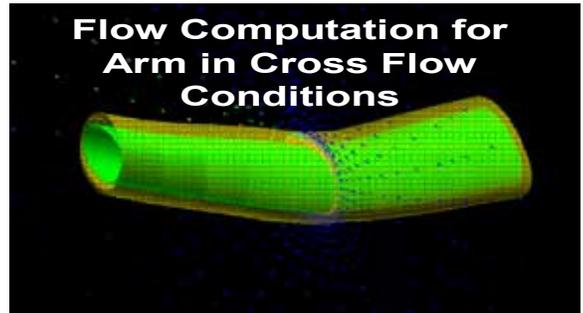
Computational models allow more freedom to examine:

- System Designs
- Relative Importance of Material Properties
- Environmental Conditions (chemical and ambient environment)

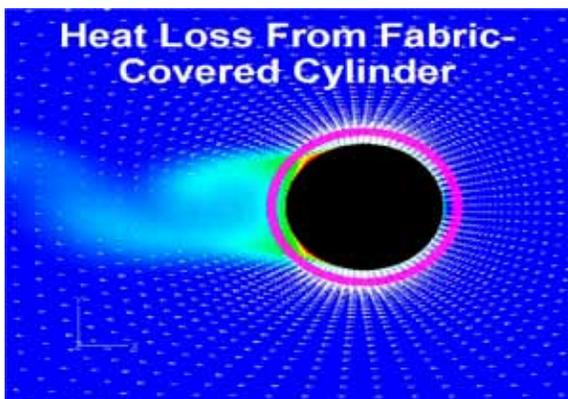
Body Surface Coordinates Obtained
from Digitized 3-D Laser Scan



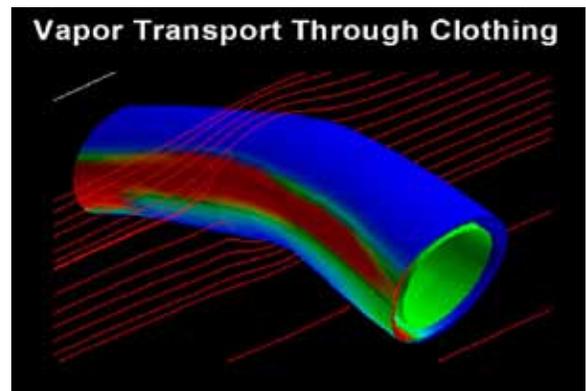
Flow Computation for
Arm in Cross Flow
Conditions



Heat Loss From Fabric-
Covered Cylinder



Vapor Transport Through Clothing



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