Philips Electronics

Electronics

PHILIPS

www.lighting.philips.com

Europe

ANSYS® Multiphysics™

ANSYS®

Overview

Royal Philips Electronics of the Netherlands is one of the world's biggest electronics companies and Europe's largest, with sales of EUR 29 billion in 2003. With activities in the three interlocking domains of healthcare, lifestyle and technology, and 166,800 employees in more than 60 countries.

Philips is No.1 in the global lighting market, a position supported by leadership in innovation combined with a systematic approach to seeking out new market opportunities. Philips Lighting strives to improve people's lives with effective and appealing lighting solutions based on a thorough understanding of people's needs, desires and aspirations.

This testimonial relates to Philips Lighting division and their use of ANSYS Multiphysics in the design of high pressure gas discharge lamps.

FE-model

Gas discharge (arc)

Testimonial

"We, at Philips Lighting, use ANSYS Multiphysics for the design optimization of high-pressure **C**eramic gas **D**ischarge **M**etal-halide lamps. The model of the CDM-lamp consists of different physics (heat, fluid and mechanics). ANSYS Multiphysics makes it possible to simulate the CDM-lamp in **one single** model. We succeeded to model the gas discharge, which is **very nonlinear** with respect to the heat generated in it. We can run several tests in a single day and gain a thorough understanding of the design performance."

Louis Peters/Joost van der Eyden
Development Engineers
Central Development Lighting
Philips Lighting B.V.
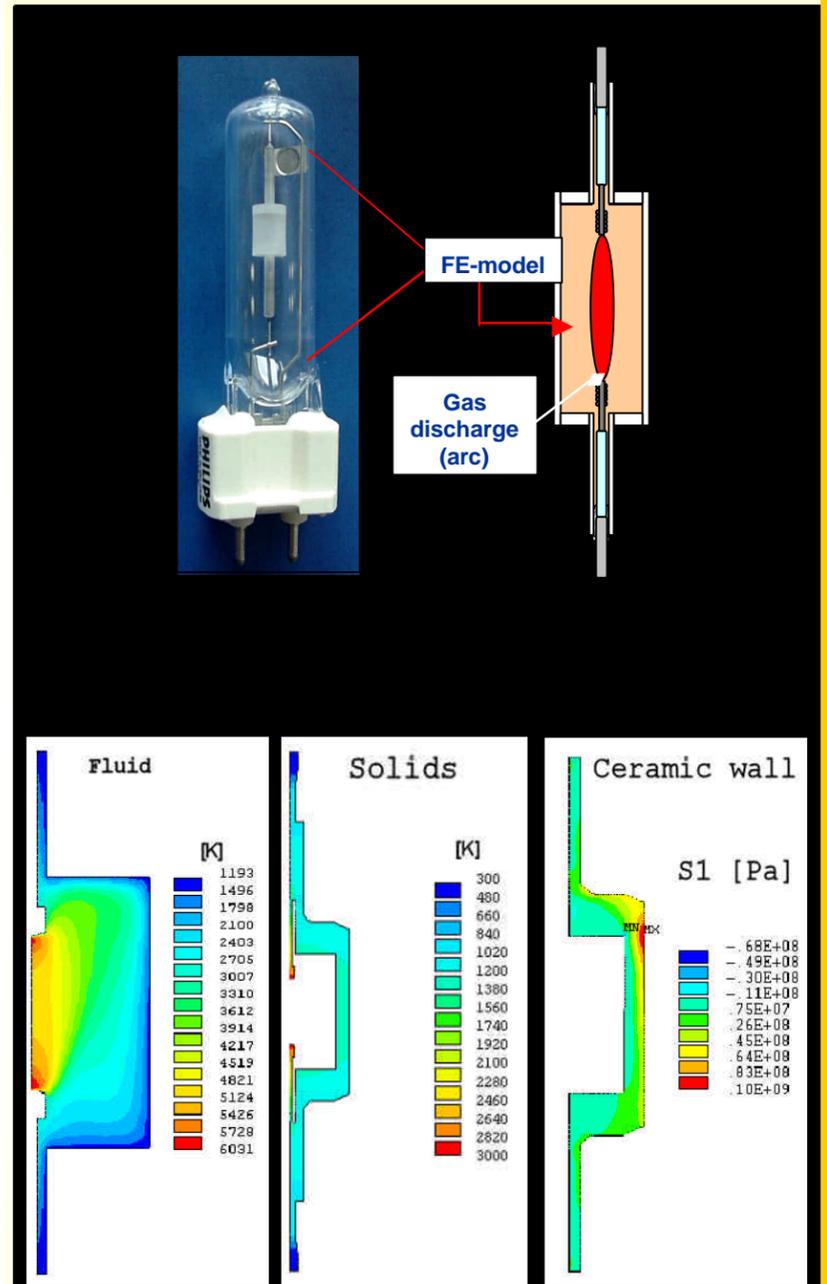
Challenge

The challenge in developing CDM-lamps is to find a thermally and mechanically robust lamp design, which is able to last a specified life time. Accurate simulation of the gas discharge, the wall temperature and the mechanical stresses are needed to fulfil these targets.

Solution

ANSYS Multiphysics was used to perform the thermo-mechanical analysis of the CDM-lamp. The gas discharge was treated as a fluid with electric conductivity, realized using the coupled field ability of ANSYS Multiphysics. Philips employed a total of four coupled physics fields to simulate the lamp:

- Fluid - Temperatures & velocities in gas discharge.
- Electric - Heat generation in gas discharge
- Thermal - Temperatures in lamp wall & electrical feed through
- Mechanical - Stresses in ceramic wall

Benefits

By using ANSYS Multiphysics, Philips is able to speed up new lamp development and also to optimize the lamp design. Using the model, Philips gets a thorough understanding of the design performance in an early stage.