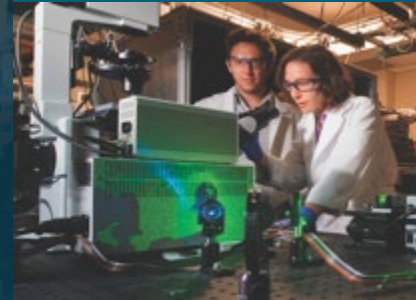# MELCOR HTML Output

PRESENTED BY

Larry Humphries

HTML Output

- Lightning fast hyper-linked navigation to MELCOR output
- Graphical depiction of core degradation
- Automatic plot generation for enhanced user efficiency
- Trend plots, profile plots, animated plots
- Plots of material property functions, EOS functions, and fluid properties automatically generated for user verification/QA
- Animated temperature profile for greater insight into accident progression
- User customized plots and model specific plots for ultimate flexibility
- Embed user customized HTML input for problem description
- Access to more data: Energy balances, energy/mass error plots, aerosol size distribution plots, CPU, distribution of aerosol sectional mass, core degradation, candled material distributions, …

User Customized Plots

- User can easily add plots of control functions or any plot variable to HTML output.

- Controls
  - Time units can be changed in HTML plot
  - Log/Linear scale for x or y axis
  - Maximum and minimum values can be selected by user

- Minimal Input Required

```
CF_HTML   4

  1 'Integral Hydrogen Mass'  'Int H2'    'Int H2 (Exp)'

  2 'Vapor Temperature SG-HL-313' 'CVH-TVAP.313'    'TEPF717'

  3 'Vapor Temperature SG-HL-316' 'CVH-TVAP.316'    'TEPF719'

  4 'Vapor Temperature SG-HL-319' 'CVH-TVAP.319'    'TEPF721'
```
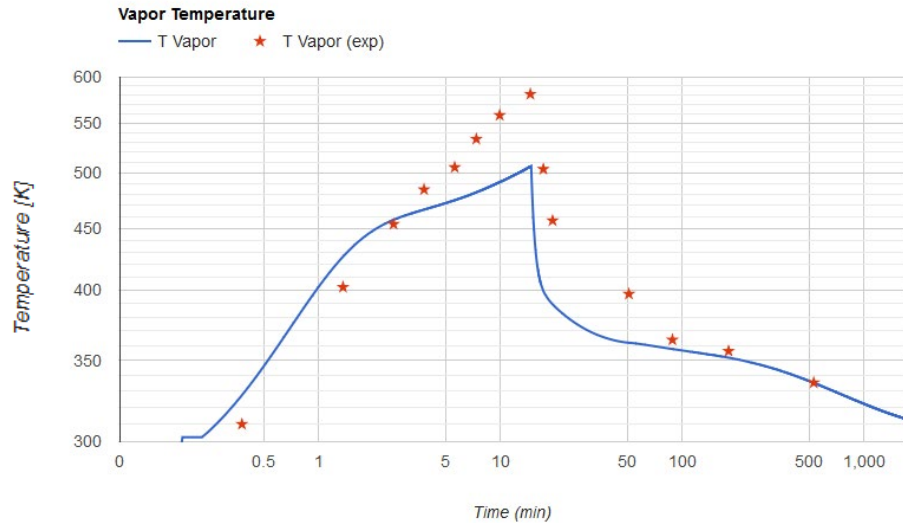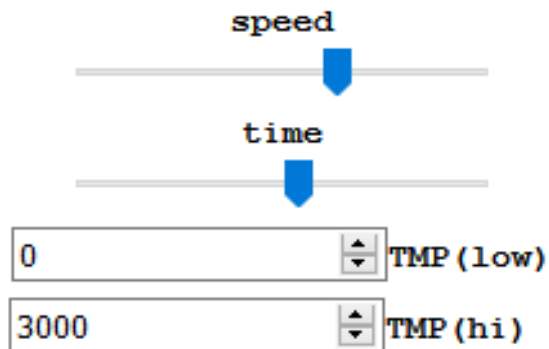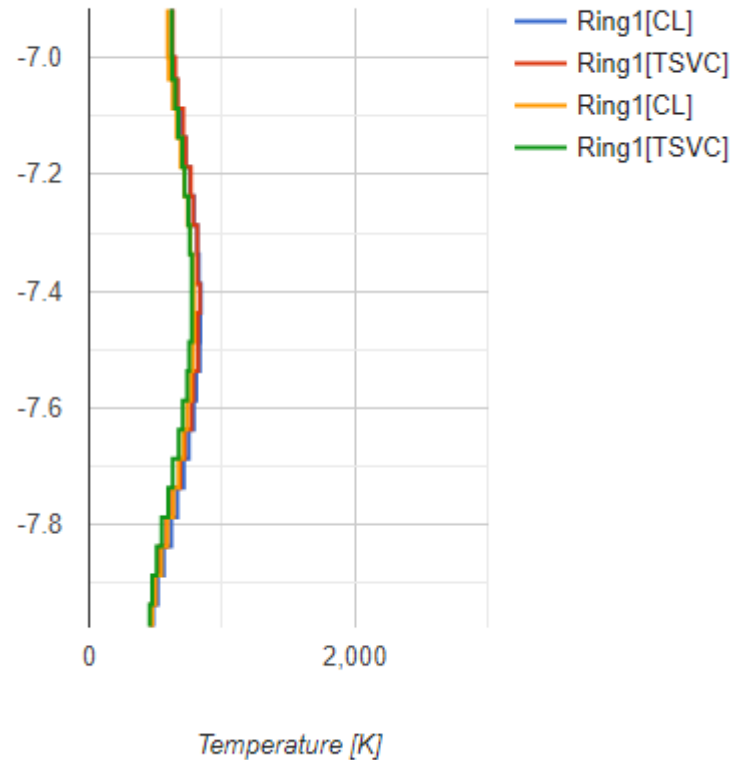
Static and Animated Profiles

- Temperatures, mass, power, surface area, volumes

- Static plots generated automatically at each time edit
  - MELGEN plots provide graphical means for verifying input

- User can create animations of component temperature profile
  - Local COR atmosphere fluid temperature also supported
  - Controls
    - Playback speed
    - Scroll to time frame
    - Maximum and minimum temperature scale

Animated Temperature Profile at 1000(sec)

Minimal Input Required

```
COR_AXPLT 2
1   RING1    3   CL   1   FU 1 NS 1 20.0   0
2   RING1b   4   CL   1 TSVC 1 CL   2 TSVC 2 20.0   0
```
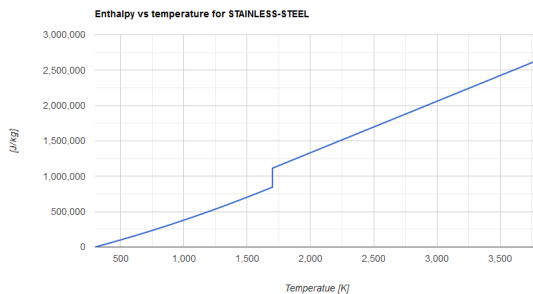
Material Property Plots Generated at MELGEN

MATERIAL PROPERTIES PACKAGE

> Show Properties for fiberglass

> Show Properties for STAINLESS-STEEL

> Show Properties for ZIRCALOY

- Materials
  - User-defined materials
  - Default Materials
- Properties
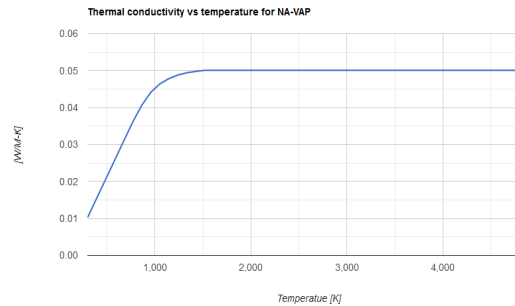 - Thermal conductivity
  - Enthalpy
  - Heat capacity

Enthalpy vs temperature for STAINLESS-STEEL

NON CONDENSIBLE GAS PACKAGE

> Show Properties for POOL

> Show Properties for NA-VAP

- Viscosity
- Thermal conductivity

Thermal conductivity vs temperature for NA-VAP
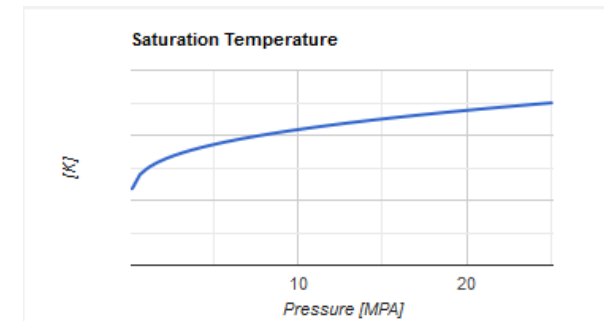
Equation of State PACKAGE

> EOS Properties for Na
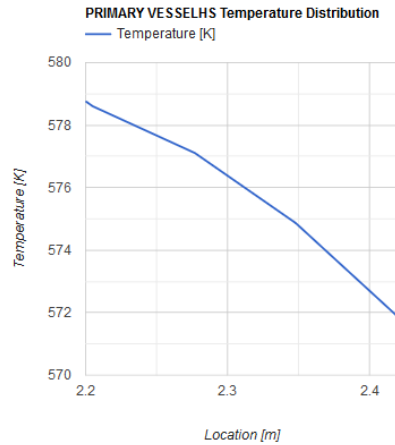
- Saturation Pressure
- Saturation Temperature
- Liquid Density at saturation
- Vapor density at saturation
- Liquid specific enthalpy at saturation pressure
- Vapor specific enthalpy at saturation pressure
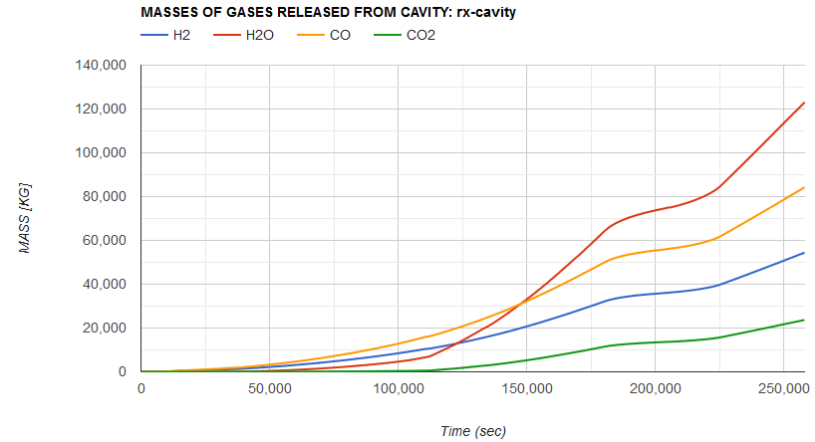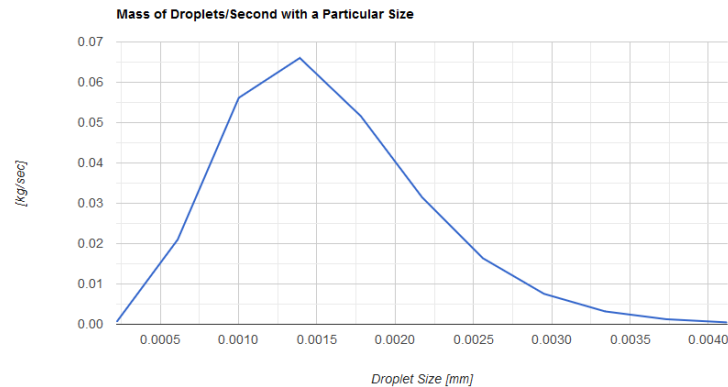- Liquid specific heat
- Vapor specific heat

Saturation Temperature

Automatically Generated Model-Dependent Plots

HS PACKAGE

MCCI MODELS

NA SPRAY FIRE MODEL

User HTML Description

User can provide formatted description of calculation, including pictures.

Used for documentation of test results.

Pictures depicting nodalization, boundary conditions, and results from previous calculations.

HTML commands embedded in document.write statements.

Example:
```
document.write("Key models exercised in the MELCOR analysis of this test include:")
document.write("<ul>")
document.write("  <li>Agglomeration behavior of hygroscopic and non-hygroscopic aerosol species</li>")
document.write("  <li>Condensation of water vapor.</li>")
document.write("  <li>Settling of aerosols.</li>")
document.write("  <li>Sodium spray fires</li>")
document.write("  <li>Radiant heat transfer in an enclosure</li>")
document.write("  <li>Radiant heat transfer to an intermediate gas</li>")
document.write("</ul>")
document.write("</br>")
document.write('<h2> Depiction of AB-5 Experimental Apparatus</h2>')
document.write('<img src="../TestPicture.png" ALT="COR State" Width=50% >')
document.write('</br>')
document.write('<img src="../Dimensions.png" ALT="COR State" Width=40% >')
document.write('<img src="../Conditions.png" ALT="COR State" Width=40% >')
document.write('</br>')
document.write('<h2>Previous Results</h2>')
document.write('<img src="../Pressure.png" ALT="COR State" Width=37% >')
document.write('<img src="../Temperature.png" ALT="COR State" Width=40% >')
document.write('<img src="../AerosolMass.png" ALT="COR State" Width=40% >')
document.write('</br>')
document.write('</br>')document.write("Key models exercised in the MELCOR analysis of this test include:")
document.write("<ul>")
document.write("  <li>Agglomeration behavior </li>")
document.write("  <li>Condensation of water vapor.</li>")
document.write("  <li>Settling of aerosols.</li>")
document.write("  <li>Sodium spray fires</li>")
document.write("  <li>Radiant heat transfer in an enclosure</li>")
document.write("  <li>Radiant heat transfer to an intermediate gas</li>")
document.write("</ul>")
document.write("</br>")
document.write('<h2> Depiction of AB-5 Experimental Apparatus</h2>')
document.write('<img src="../TestPicture.png" ALT="COR State" Width=50% >')
document.write('</br>')
document.write('<img src="../Dimensions.png" ALT="COR State" Width=40% >')
document.write('<img src="../Conditions.png" ALT="COR State" Width=40% >')
document.write('</br>')
document.write('<h2>Previous Results</h2>')
document.write('<img src="../Pressure.png" ALT="COR State" Width=37% >')
document.write('<img src="../Temperature.png" ALT="COR State" Width=40% >')
document.write('<img src="../AerosolMass.png" ALT="COR State" Width=40% >')
document.write('</br>')
document.write('</br>')
```

Background

The Aerosol Behavior Code Validation and Evaluation (ABCOVE) experiments investigat breeder reactors (LMFBRs). The experiments provide a basis for judging the adequacy aerosol attenuation in containment buildings during postulated accidents. The ABCOVE Systems Test Facility (CSTF) located at the Hanford Engineering Development Laborato

This MELCOR assessment uses the MELCOR sodium chemistry (NAC) package, based o sodium atmospheric chemistry.

Key models exercised in the MELCOR analysis of this test include:

- Agglomeration behavior of hygroscopic and non-hygroscopic aerosol species
- Condensation of water vapor.
- Settling of aerosols.
- Sodium spray fires
- Radiant heat transfer in an enclosure
- Radiant heat transfer to an intermediate gas

Depiction of AB-5 Experimental Apparatus