

P <Build> <Control Volumes> <NULL>  
R <ENGLISH>

```
#####
# Part 1
#####
```

```
# -----
# Build Room Volume
# -----
P <Control Volumes> <Draw Volume> <NULL>
B <1> <0.05> <-0.05>
B <1> <0.65> <-0.65>
T <control_vol> <R1C2> <Room>
T <control_vol> <R1C3> <100>
T <control_vol> <R1C4> <0>
T <control_vol> <R1C5> <10>
T <control_vol> <R1C6> <10>
```

```
# -----
# Build Computer Volume and Subdivide
# -----
P <Control Volumes> <Draw Volume> <NULL>
B <1> <0.25> <-0.25>
B <1> <0.35> <-0.45>
T <control_vol> <R2C2> <Computer>
T <control_vol> <R2C3> <1.5>
T <control_vol> <R2C4> <0>
T <control_vol> <R2C5> <1.4>
T <control_vol> <R2C6> <1>
```

```
P <Control Volumes> <Subdivided Volumes> <NULL>
K <2>
R <Yes>
P <Turb. Parameters> <Done> <NULL>
```

```
P <Subdivided Volumes> <Volume Dimensions and Reference> <NULL>
P <Volume Dimensions and Reference> <Depth (Y-Axis)> <0.6>
P <Volume Dimensions and Reference> <Width (X-Axis)> <2>
P <Volume Dimensions and Reference> <Xref> <0>
P <Volume Dimensions and Reference> <Yref> <0>
P <Volume Dimensions and Reference> <Zref> <0>
P <Volume Dimensions and Reference> <Done> <NULL>
```

```
P <Subdivided Volumes> <Grid Lines> <NULL>
P <Grid Lines> <Direction> <X>
P <Grid Lines> <_Number> <4>
P <Grid Lines> <Add> <NULL>
```

```
P <Grid Lines> <Direction> <Y>
P <Grid Lines> <_Number> <1>
P <Grid Lines> <Range> <0.2-0.2>
P <Grid Lines> <Add> <NULL>
```

```
P <Grid Lines> <Direction> <Z>
P <Grid Lines> <_Number> <1>
P <Grid Lines> <Range> <0.4-0.4>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <0.8-0.8>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <1.0-1.0>
P <Grid Lines> <Add> <NULL>
```

```
P <Grid Lines> <Done> <NULL>
```

```

# -----
# Create blockages
# -----
P <Subdivided Volumes> <Blockages> <NULL>
P <Blockages> <Blockage Number> <1>
P <Blockages> <Description> <NULL>
T <blockages1_&v4> <R1C2> <PSU>
P <Blockages> <Blockage Coordinates> <NULL>
P <Blockage Coordinates> <X1> <0>
P <Blockage Coordinates> <Y1> <0>
P <Blockage Coordinates> <Z1> <0>
P <Blockage Coordinates> <X2> <0.8>
P <Blockage Coordinates> <Y2> <0.6>
P <Blockage Coordinates> <Z2> <0.4>
P <Blockage Coordinates> <Done> <NULL>

P <Blockages> <Blockage Number> <2>
P <Blockages> <Description> <NULL>
T <blockages1_&v4> <R2C2> <GPU>
P <Blockages> <Blockage Coordinates> <NULL>
P <Blockage Coordinates> <X1> <0>
P <Blockage Coordinates> <Y1> <0.2>
P <Blockage Coordinates> <Z1> <0.8>
P <Blockage Coordinates> <X2> <1.2>
P <Blockage Coordinates> <Y2> <0.6>
P <Blockage Coordinates> <Z2> <1.0>

P <Blockage Coordinates> <Done> <NULL>

P <Blockages> <Update All Blockages> <NULL>
R <Yes>
P <Blockages> <Done> <NULL>
P <Subdivided Volumes> <Volume Variations> <NULL>
P <Volume Variations> <Volume Porosity> <0.66>
P <Volume Variations> <Select Cells> <NULL>
C <25>
C <40>
B <2> <0.320884> <-0.112420>

P <Volume Variations> <Done> <NULL>

P <Subdivided Volumes> <Done> <NULL>

# -----
# Build Lumped Volumes
# -----
P <Control Volumes> <Draw Volume> <NULL>
B <1> <0.26> <-0.49>
B <1> <0.29> <-0.51>
T <control_vol> <R3C2> <Intake>
T <control_vol> <R3C3> <0.1>
T <control_vol> <R3C4> <0>
T <control_vol> <R3C5> <0.8>
T <control_vol> <R3C6> <1.0>

P <Control Volumes> <Draw Volume> <NULL>
B <1> <0.26> <-0.19>
B <1> <0.29> <-0.21>
T <control_vol> <R4C2> <Exhaust1>
T <control_vol> <R4C3> <0.1>
T <control_vol> <R4C4> <1.0>
T <control_vol> <R4C5> <0.4>
T <control_vol> <R4C6> <1.0>

P <Control Volumes> <Draw Volume> <NULL>

```

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B <1> <0.31> <-0.19>
B <1> <0.34> <-0.21>
T <control_vol> <R5C2> <Exhaust2>
T <control_vol> <R5C3> <0.1>
T <control_vol> <R5C4> <1.4>
T <control_vol> <R5C5> <0.1>
T <control_vol> <R5C6> <1.0>

P <Control Volumes> <Draw Volume> <NULL>
B <1> <0.31> <-0.49>
B <1> <0.34> <-0.51>
T <control_vol> <R6C2> <Leakage>
T <control_vol> <R6C3> <0.1>
T <control_vol> <R6C4> <0.4>
T <control_vol> <R6C5> <0.4>
T <control_vol> <R6C6> <1.0>

# -----
# Build Openings
# -----
P <Build> <3D Connectors> <NULL>
P <3D Connectors> <Draw 3D Connector> <NULL>
B <1> <0.28> <-0.50>
B <2> <0.28> <-0.42>

P <3D Connectors> <Draw 3D Connector> <NULL>
B <1> <0.28> <-0.28>
B <2> <0.28> <-0.20>

P <3D Connectors> <Draw 3D Connector> <NULL>
B <1> <0.32> <-0.28>
B <2> <0.32> <-0.20>

P <3D Connectors> <Draw 3D Connector> <NULL>
B <1> <0.32> <-0.50>
B <2> <0.32> <-0.42>

T <3d_connectors> <R1C2> <Intake x2>
T <3d_connectors> <R2C2> <Exhaust>
T <3d_connectors> <R3C2> <Exhaust>
T <3d_connectors> <R4C2> <Misc Openings>
T <3d_connectors> <R1-4C5> <0.5>
T <3d_connectors> <R1-4C7> <0.5>

P <Build> <3D Connectors> <NULL>
P <3D Connectors> <Locate End Connections> <NULL>
K <2s>
P <3D Connectors> <Locate End Connections> <NULL>
K <1b>
C <5E>
C <20E>
K <2a>
C <31W>
C <36W>
K <3a>
C <33T>
C <38T>
K <4b>
C <11W>
C <16W>
B <2> <0.014721> <-0.119843>

P <Build> <3D Connectors> <Done>

```

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# -----
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# Build Case Fans
# -----
P <Build> <Components> <NULL>
P <Components> <Volumetric Fans> <NULL>
P <Volumetric Fans> <Locate Vol. Fan> <NULL>
B <1> <0.28> <-0.48>
B <1> <0.28> <-0.40>

P <Volumetric Fans> <Locate Vol. Fan> <NULL>
B <1> <0.28> <-0.22>
B <1> <0.28> <-0.20>

P <Volumetric Fans> <Locate Vol. Fan> <NULL>
B <1> <0.32> <-0.22>
B <1> <0.32> <-0.20>

T <vol_fan> <R1C2> <Front Intake 2x120mm>
T <vol_fan> <R2C2> <Back Exhaust 120mm>
T <vol_fan> <R3C2> <Top Exhaust 120mm>
P <Tools> <Format Table> <NULL>
P <Format Table> <Column Number> <2>
P <Format Table> <Width> <22>
P <Format Table> <Done> <NULL>

P <Volumetric Fans> <Edit Table 2> <NULL>
T <vol_fan1> <R1C3> <3.0>
T <vol_fan1> <R2-3C3> <1.4>

P <Volumetric Fan Parameters - 2> <Done> <NULL>
P <Volumetric Fans> <Done> <NULL>
P <Build> <Components> <Done>

# -----
# Build Connecting Flow Paths
# -----
P <Build> <Flow Paths> <NULL>
P <Flow Paths> <Draw Flow Path> <NULL>
B <1> <0.28> <-0.56>
B <2> <0.28> <-0.50>
P <Flow Paths> <Draw Flow Path> <NULL>
B <1> <0.28> <-0.14>
B <2> <0.28> <-0.20>
P <Flow Paths> <Draw Flow Path> <NULL>
B <1> <0.32> <-0.14>
B <2> <0.32> <-0.20>
P <Flow Paths> <Draw Flow Path> <NULL>
B <1> <0.32> <-0.56>
B <2> <0.32> <-0.50>

P <Flow Paths> <Edit Table 1> <NULL>
T <flow_paths> <R1C2> <Intake>
T <flow_paths> <R1C5,9> <0>
T <flow_paths> <R1C6,10> <0.8>
T <flow_paths> <R2C2> <Exhaust1>
T <flow_paths> <R2C5,9> <1.0>
T <flow_paths> <R2C6,10> <0.4>
T <flow_paths> <R3C2> <Exhaust2>
T <flow_paths> <R3C5> <1.4>
T <flow_paths> <R3C9> <1.41>
T <flow_paths> <R3C6,10> <0.01>
T <flow_paths> <R4C2> <Leakage>
T <flow_paths> <R4C5,9> <0.4>
T <flow_paths> <R4C6,10> <0.4>

P <Flow Path Parameters - 1> <Edit Table 2> <NULL>

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T <flow_paths2> <R1C2> <.24>
T <flow_paths2> <R2-3C2> <0.2>
T <flow_paths2> <R4C2> <0.06>
T <flow_paths2> <R1-4C3> <1>
T <flow_paths2> <R1-4C4> <1>

P <Flow Path Parameters - 2> <Edit Table 3> <NULL>
T <flow_paths3> <R1-4C2,4> <1.5>

# -----
# Set Initial Conditions
# -----
P <Build> <Initial Conditions> <NULL>
P <Initial Conditions> <Vapor Temperature> <65>
P <Initial Conditions> <Liquid Temperature> <65>
P <Initial Conditions> <Relative Humidity, %> <0>
P <Initial Conditions> <Apply to Default Values> <NULL>

P <Initial Conditions> <Done> <NULL>

# -----
# Set Run Control
# -----
P <Build> <Run Control> <NULL>
P <Run Control> <Run Options> <NULL>
P <Run Options> <Parallel Processes for Solver> <4>
P <Run Options> <Done> <NULL>
P <Run Control> <Time Domains> <NULL>
P <Time Domains> <Solution Options> <NULL>
P <Solution Options> <Pressure Solution Method> <CONJUGATE>
P <Solution Options> <Done> <NULL>
P <Time Domains> <Done> <NULL>

# -----
# Create Vector/Contour Plot of Flow
# -----
P <Results> <Vector/Contour Graphs> <NULL>
P <Vector/Contour Graphs> <Scaling Value> <0>
P <Vector/Contour Graphs> <Graph Number> <1>
P <Vector/Contour Graphs> <Description> <NULL>
R <Case Flow Pattern>
P <Vector/Contour Graphs> <Graph Type> <VECTOR>
P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.10> <-0.10>
B <1> <0.51> <-0.42>
P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.10> <-0.50>
B <1> <0.51> <-0.82>
P <Vector/Contour Graphs> <Graph Type> <VECTOR>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.2> <-0.20>
B <1> <0.3> <-0.35>
C <6>
C <40>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.2> <-0.50>
B <1> <0.3> <-0.35>
C <1>
C <35>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Velocity> <NULL>
P <Vector/Contour Variables> <Done> <NULL>
P <Vector/Contour Graphs> <Plot Time> <200>

P <Tools> <Sketch> <NULL>

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P <Sketch> <Rectangle> <NULL>
B <1> <0.10> <-0.42>
B <1> <0.26> <-0.33>
P <Sketch> <Rectangle> <NULL>
B <1> <0.10> <-0.82>
B <1> <0.26> <-0.73>
P <Sketch> <Rectangle> <NULL>
B <1> <0.10> <-0.19>
B <1> <0.34> <-0.23>

#####
# Part 2
#####

# -----
# Import Material
# -----
P <Resources> <Materials> <NULL>

P <Materials> <Material Type #> <1>
R <Aluminum>

# -----
# Add Thermal Conductor Surface Options
# -----
P <Build> <Thermal Conductors> <NULL>
P <Thermal Conductors> <Surface Options> <NULL>
P <Conductor Surface Options - Table 1> <Surface Option Number> <1>
T <htc1> <R1C2> <Direct>

P <Conductor Surface Options - Table 1> <Surface Option Number> <2>
T <htc1> <R2C2> <Insulated>
P <Conductor Surface Options - Table 1> <Select Surface Option> <NULL>
P <Select Surface Option> <Sp Heat Flux> <NULL>
P <Conductor Surface Options - Table 1> <Nominal Value> <0>

# -----
# Add Thermal Conductor Type
# -----
P <Thermal Conductors> <Conductor Types> <NULL>
P <Conductor Types> <Type Number> <1>
T <geoms> <R1C2> <CPU>
P <Conductor Types> <Thickness> <0.02>
P <Conductor Types> <Int. Heat Rate> <7>
P <Conductor Types> <Define Regions> <NULL>
P <Define Regions> <Material Type #> <NULL>
R <1 Aluminum>
P <Define Regions> <Region Number> <1>
P <Define Regions> <Heat Rate Factor> <1>
P <Define Regions> <Done> <NULL>
P <Conductor Types> <Type Number> <2>
T <geoms> <R2C2> <GPU>
P <Conductor Types> <Thickness> <0.02>
P <Conductor Types> <Int. Heat Rate> <20>
P <Conductor Types> <Define Regions> <NULL>
P <Define Regions> <Material Type #> <NULL>
R <1 Aluminum>
P <Define Regions> <Region Number> <1>
P <Define Regions> <Heat Rate Factor> <1>
P <Define Regions> <Done> <NULL>

P <Conductor Types> <Done> <NULL>

# -----
# Add Thermal Conductors

```

```

# -----
P <Thermal Conductors> <Draw Conductor> <NULL>
B <1> <0.3> <-0.35>
T <therm_cond> <R1C2> <CPU>
P <Thermal Conductors> <Draw Conductor> <NULL>
B <1> <0.3> <-0.40>
T <therm_cond> <R2C2> <GPU>

P <Thermal Conductors> <Edit Table> <NULL>
P <Conductor Parameters> <Conductor Number> <1-2>
P <Conductor Parameters> <Surface Option #, Side A> <NULL>
R <1 Direct>
P <Conductor Parameters> <Surface Option #, Side B> <NULL>
R <2 Insulated>

P <Conductor Parameters> <Conductor Number> <1>
P <Conductor Parameters> <Surface Area> <2>
P <Conductor Parameters> <Initial Temperature> <115>
P <Conductor Parameters> <Conductor Type> <NULL>
R <1 CPU>

P <Conductor Parameters> <Conductor Number> <2>
P <Conductor Parameters> <Surface Area> <4>
P <Conductor Parameters> <Initial Temperature> <170>
P <Conductor Parameters> <Conductor Type> <NULL>
R <2 GPU>
P <Conductor Parameters> <Surface Assignment, Side A> <NULL>
P <Surface Assignment> <3D Blockage> <NULL>
R <2 GPU>

P <Conductor Parameters> <Conductor Number> <1>
P <Conductor Parameters> <Surface Assignment, Side A> <NULL>
P <Surface Assignment> <Subvolume> <NULL>
R <Yes>
K <1>
C <37>
P <Conductor Parameters> <Done> <NULL>

P <Thermal Conductors> <Done> <NULL>

# -----
# Create Control Variable for Average Temperature
# -----
P <Resources> <Control Variables> <NULL>
P <Control Variables> <C.V. Number> <1>
T <control_var> <R1C2> <Average Temp>
P <Control Variables> <Functional Form> <>
P <Functional Form> <Sum-Difference> <NULL>
P <Control Variables> <Initial Value> <65>
P <Control Variables> <Multiplier G> <0.030303>
P <Control Variables> <Function Components> <NULL>
P <Function Components> <Component Number> <1>
P <Function Components> <Component Class> <none>
P <CV Component Classes> <Volume Variable> <NULL>
P <Function Components> <Component Name> <NULL>
R <Temv          - vapor temperature (F) [Cs2] >
K <2s>
R <Yes>
K <2s>
R <No>
C <1>
C <7>
C <26>
C <28>
B <2> <0.191886> <-0.477999>

```

```

T <cv1 &v32> <R2-8C4> <-1>

P <Function Components> <Done> <NULL>
P <Control Variables> <Done> <NULL>

# -----
# Create Vector/Contour Plots of Temperature
# -----
P <Results> <Vector/Contour Graphs> <NULL>
P <Vector/Contour Graphs> <Graph Number> <2>
P <Vector/Contour Graphs> <Same As Graph> <1>
P <Vector/Contour Graphs> <Graph Type> <CONTOUR>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Temperature> <NULL>
P <Vector/Contour Variables> <Done> <NULL>
P <Vector/Contour Graphs> <Minimum Level> <75>
P <Vector/Contour Graphs> <Maximum Level> <95>
P <Vector/Contour Graphs> <Contour Levels> <19>
P <Vector/Contour Graphs> <Description> <NULL>
R <Temperature Contour Plot>

# -----
# Create Line Graph of Temperature
# -----
P <Results> <Line Graphs> <NULL>
P <Line Graphs> <Graph Number> <3>
P <Line Graphs> <Description> <NULL>
R <Temperature vs. Time>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Phase Variable> <NULL>
P <Phase Variable> <Temperature> <NULL>
K <1>
B <2> <0.349974> <-0.349459>
P <Phase Variable> <Done> <NULL>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Control Variable> <NULL>
R <1 Average Temp>
P <Line Graphs> <Done> <NULL>

#####
# Part 3
#####

# -----
# Build trips
# -----
P <Resources> <Trips> <NULL>
P <Component Trips> <Trip Number> <1>
T <trips> <R1C2> <AC On>
P <Component Trips> <Trip Number> <2>
T <trips> <R2C2> <AC Off>
P <Component Trips> <Trip Number> <1-2>
P <Component Trips> <Sense Variable> <VAP TEMP>
P <Component Trips> <Select Sensor 1 Location> <NULL>
B <1> <0.469561> <-0.450516>
P <Component Trips> <Trip Number> <1>
P <Component Trips> <Variable Limit> <GT>
P <Component Trips> <Set Point> <70>
P <Component Trips> <Reset Trip #> <2>
P <Component Trips> <Trip Number> <2>
P <Component Trips> <Variable Limit> <LT>
P <Component Trips> <Set Point> <65>
P <Component Trips> <Reset Trip #> <1>

# -----

```



```

# Build Boundary Conditions
# -----
P <Build> <Boundary Conditions> <NULL>
P <Boundary Conditions> <Draw BC> <NULL>
B <1> <0.05> <-0.70>
B <1> <0.15> <-0.80>
P <Boundary Conditions> <Draw BC> <NULL>
B <1> <0.55> <-0.70>
B <1> <0.65> <-0.80>

P <Boundary Conditions> <Edit Table 1> <NULL>
P <BC Parameters - Table 1> <Boundary Condition #> <1>
P <BC Parameters - Table 1> <Type> <PRESSURE>
P <BC Parameters - Table 1> <Boundary Condition #> <2>
P <BC Parameters - Table 1> <Type> <FLOW>
T <bc1> <R1C2> <Outlet>
T <bc1> <R2C2> <AC>
T <bc1> <R1-2C3> <14.7>
T <bc1> <R1C5> <65>
T <bc1> <R2C5> <55>
T <bc1> <R1-2C13> <0>
T <bc1> <R2C7> <v1>
P <BC Parameters - Table 1> <On Trip> <NULL>
R <1 AC On>
P <BC Parameters - Table 1> <Off Trip> <NULL>
R <2 AC Off>

P <BC Parameters - Table 1> <Edit Table 2> <NULL>
T <bc2> <R1-2C2> <0>
T <bc2> <R1-2C4> <0>

P <BC Parameters - Table 2> <Edit Table 3> <NULL>
T <bc3> <R1-2C2> <1>
P <BC Parameters - Table 3> <Done> <NULL>

# -----
# Build Connecting Flow Paths
# -----
P <Build> <Flow Paths> <NULL>
P <Flow Paths> <Draw Flow Path> <NULL>
B <1> <0.10> <-0.73>
B <2> <0.10> <-0.62>
P <Flow Paths> <Draw Flow Path> <NULL>
B <1> <0.60> <-0.73>
B <2> <0.60> <-0.62>

P <Flow Paths> <Edit Table 1> <NULL>

P <Flow Path Parameters - 1> <Flow Path Number> <6>
P <Flow Path Parameters - 1> <Change to F.P. #> <1>
P <Flow Path Parameters - 1> <Change to F.P. #> <1>

T <flow_paths> <R1C2> <Outlet>
T <flow_paths> <R2C2> <AC>
T <flow_paths> <R1-2C5,9> <0>
T <flow_paths> <R1-2C6,10> <10>

P <Flow Path Parameters - 1> <Edit Table 2> <NULL>
T <flow_paths2> <R1-2C2> <100>
T <flow_paths2> <R1-2C3> <10>
T <flow_paths2> <R1-2C4> <1>

P <Flow Path Parameters - 2> <Edit Table 3> <NULL>
T <flow_paths3> <R1-2C2,4> <1.5>

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```
#####
# Part 4
#####

# -----
# Build Fan Speed Stepping Function
# -----
P <Resources> <Table Functions> <NULL>
P <Table Functions> <Function Number> <1>
T <ffs> <R2C2> <Case Fans>
P <Table Functions> <Edit Data Table> <NULL>
T <ff\ &v41> <R1C1> <0>
T <ff\ &v41> <R1C2> <0>
T <ff\ &v41> <R1C3> <140>
T <ff\ &v41> <R1C4> <0>
T <ff\ &v41> <R2C1> <140.1>
T <ff\ &v41> <R2C2> <0.35>
T <ff\ &v41> <R2C3> <160>
T <ff\ &v41> <R2C4> <0.35>
T <ff\ &v41> <R3C1> <160.1>
T <ff\ &v41> <R3C2> <0.4>
T <ff\ &v41> <R3C3> <180>
T <ff\ &v41> <R3C4> <0.4>
T <ff\ &v41> <R4C1> <180.1>
T <ff\ &v41> <R4C2> <0.5>
T <ff\ &v41> <R4C3> <200>
T <ff\ &v41> <R4C4> <0.5>
T <ff\ &v41> <R5C1> <200.1>
T <ff\ &v41> <R5C2> <0.7>
T <ff\ &v41> <R5C3> <220>
T <ff\ &v41> <R5C4> <0.7>
T <ff\ &v41> <R6C1> <220.1>
T <ff\ &v41> <R6C2> <1>
T <ff\ &v41> <R6C3> <10000>
T <ff\ &v41> <R6C4> <1>

# -----
# Add Required Control Variables
# -----
P <File> <Write Solver Input> <NULL>
R <Yes to All>
P <Resources> <Control Variables> <NULL>
P <Control Variables> <C.V. Number> <2>
T <control_var> <R2C2> <Max GPU Temp>
P <Control Variables> <Functional Form> <sum>
P <Functional Form> <Maximum> <NULL>
P <Control Variables> <Initial Value> <65>
P <Control Variables> <Function Components> <NULL>
P <Function Components> <Component Number> <1>
P <Function Components> <Component Class> <none>
P <CV Component Classes> <Conductor Variable> <NULL>
P <Function Components> <Component Name> <NULL>
R <Tsrfs(s) - conductor surface temperature (F) >
K <2>
K <2s>
C <16>
C <17>
C <18>
C <36>
C <37>
C <38>
B <2> <0.226758> <-0.160600>
P <Function Components> <Done> <NULL>

P <Control Variables> <C.V. Number> <3>
```

```

T <control_var> <R3C2> <Fan Speed>
P <Control Variables> <Functional Form> <max>
P <Functional Form> <Table Function> <NULL>
P <Control Variables> <Function Components> <NULL>
P <Function Components> <Component Number> <1>
P <Function Components> <Component Class> <none>
P <CV Component Classes> <Control Variable> <NULL>
P <Function Components> <Component Name> <NULL>
R <2 Max GPU Temp>
P <Function Components> <Component Number> <2>
P <Function Components> <Component Class> <Control Variable>
P <CV Component Classes> <Data Curve> <NULL>
R <1 Case Fans>
P <CV Component Classes> <Done> <NULL>
P <Function Components> <Done> <NULL>

# -----
# Update Volumetric Fan FF
# -----
P <Build> <Components> <NULL>
P <Components> <Volumetric Fans> <NULL>
P <Volumetric Fans> <Edit Table 2> <NULL>
P <Volumetric Fan Parameters - 2> <Vol. Fan Number> <1-3>
P <Volumetric Fan Parameters - 2> <Flow Rate FF> <NULL>
P <Forcing Function Types> <Control Variable> <NULL>
R <3 Fan Speed>

# -----
# Add New Plots
# -----
P <Results> <Line Graphs> <NULL>
P <Line Graphs> <Graph Number> <4>
P <Line Graphs> <Description> <NULL>
R <Max GPU Temp>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Control Variable> <NULL>
R <2 Max GPU Temp>

P <Line Graphs> <Graph Number> <5>
P <Line Graphs> <Description> <NULL>
R <Volumetric Fan Flow>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Volumetric Fan Variable> <NULL>
P <Component Variable 1> <VFan Flow> <NULL>
B <1> <0.299492> <-0.466576>
B <2> <0.299492> <-0.459081>
P <Component Variable 1> <Done> <NULL>

#####
# Part 5a
#####

# -----
# Make Two Copies of the Computer
# -----
P <Build> <Control Volumes> <NULL>
P <Edit> <Copy> <NULL>
B <1> <0.23> <-0.12>
B <1> <0.37> <-0.58>
P <Edit> <Paste> <NULL>
B <1> <0.09> <-0.12>
B <1> <0.23> <-0.58>
P <Edit> <Paste> <NULL>
B <1> <0.40> <-0.12>
B <1> <0.54> <-0.58>

```

```
P <Build> <Flow Paths> <NULL>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.14> <-0.53>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.14> <-0.17>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.18> <-0.17>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.18> <-0.53>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.45> <-0.53>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.45> <-0.17>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.49> <-0.17>
P <Flow Paths> <Connect Loose Ends> <NULL>
B <1> <0.49> <-0.53>
```

```
#find and replace 3D connector description
P <Build> <3D Connectors> <NULL>
S <3d_connectors> <Exhaust> <Exit Fan> <> <0> <0>
S <3d_connectors> <Intake> <Intake Fan> <> <0> <0>
```

```
#find and replace volumetric fan description
P <Build> <Components> <NULL>
P <Components> <Volumetric Fans> <NULL>
S <vol_fan> <Intake> <Fan> <> <0> <0>
S <vol_fan> <Exhaust> <Fan> <> <0> <0>
```

```
P <Build> <Control Volumes> <NULL>
P <Tools> <Sketch> <NULL>
P <Sketch> <Centered Text> <NULL>
B <1> <0.3> <-0.35>
R <Computer 1>
P <Sketch> <Centered Text> <NULL>
B <1> <0.16> <-0.35>
R <Computer 2>
P <Sketch> <Centered Text> <NULL>
B <1> <0.47> <-0.35>
R <Computer 3>
P <Sketch> <Centered Text> <NULL>
B <1> <0.1> <-0.76>
R <Return>
P <Sketch> <Centered Text> <NULL>
B <1> <0.6> <-0.76>
R <AC Vent>
P <Sketch> <Centered Text> <NULL>
B <1> <0.33> <-0.1>
R <Server Room>
```

```
#####
# Part 5b
#####
```

```
# -----
# Update Boundary Condition Flow Rate
# -----
T <bc1> <R2C7> <v3>
```

```
#####
# Part 6a
#####
```

```
# -----
```

```

# Subdivide Room
# -----
P <Build> <Control Volumes> <NULL>
T <control_vol> <R1C3> <554.4>
T <control_vol> <R1C5> <8.4>
T <control_vol> <R1C6> <5.4>
P <Control Volumes> <Subdivided Volumes> <NULL>
B <1> <0.135367> <-0.094557>
R <Yes>
P <Turb. Parameters> <Done> <NULL>
P <Subdivided Volumes> <Volume Dimensions and Reference> <NULL>
P <Volume Dimensions and Reference> <Width (X-Axis)> <10>
P <Volume Dimensions and Reference> <Depth (Y-Axis)> <6.6>
P <Volume Dimensions and Reference> <Xref> <0>
P <Volume Dimensions and Reference> <Yref> <0>
P <Volume Dimensions and Reference> <Done> <NULL>
P <Subdivided Volumes> <Grid Lines> <NULL>
P <Grid Lines> <_Number> <5>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Direction> <X>
P <Grid Lines> <_Number> <4>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Direction> <Y>
P <Grid Lines> <_Number> <1>
P <Grid Lines> <Range> <1.2-1.2>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <1.8-1.8>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <3.0-3.0>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <3.6-3.6>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <4.8-4.8>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Range> <5.4-5.4>
P <Grid Lines> <Add> <NULL>
P <Grid Lines> <Done> <NULL>

# -----
# Block out regions occupied by computers
# -----
P <Subdivided Volumes> <Volume Variations> <NULL>
P <Volume Variations> <Volume Porosity> <0>
P <Volume Variations> <Select Cells> <NULL>
C <8>
C <8>
C <18>
C <18>
C <28>
C <28>
B <2> <0.092792> <-0.310458>
P <Volume Variations> <Done> <NULL>

# -----
# Position flow connectors within subdivided volume
# -----
P <Build> <Flow Paths> <NULL>
P <Flow Paths> <Display Subvolumes> <NULL>
B <1> <0.1> <-0.1>
P <Flow Paths> <Position Flow Conn.> <NULL>
K <1a>
C <21W>
K <2a>
C <185T>
K <3a>

```

```

C <19W>
K <4a>
C <17E>
K <5a>
C <53B>
K <6a>
C <17E>
K <7a>
C <9W>
K <8a>
C <7E>
K <9a>
C <43B>
K <10a>
C <7E>
K <11a>
C <29W>
K <12a>
C <27E>
K <13a>
C <63B>
K <14a>
C <27E>
B <2> <0.014721> <-0.119843>a

# -----
# Adjust flow paths connected to boundary conditions
# -----
P <Flow Paths> <Edit Table 1> <NULL>
P <Flow Path Parameters - 1> <Flow Path Number> <1>
P <Flow Path Parameters - 1> <End A Height> <1.4>
P <Flow Path Parameters - 1> <End B Height> <1.4>
P <Flow Path Parameters - 1> <Edit Table 2> <NULL>
P <Flow Path Parameters - 2> <Flow Area> <0.84>
P <Flow Path Parameters - 2> <Hyd. Diam.> <0.9>

P <Flow Paths> <Edit Table 1> <NULL>
P <Flow Path Parameters - 1> <Flow Path Number> <2>
P <Flow Path Parameters - 1> <End A Elev.> <8.39>
P <Flow Path Parameters - 1> <End A Height> <0.01>
P <Flow Path Parameters - 1> <End B Elev.> <8.4>
P <Flow Path Parameters - 1> <End B Height> <0.01>
P <Flow Path Parameters - 1> <Edit Table 2> <NULL>
P <Flow Path Parameters - 2> <Flow Area> <0.25>
P <Flow Path Parameters - 2> <Hyd. Diam.> <0.25>

P <Build> <Boundary Conditions> <NULL>

# -----
# Position sensor location within subdivided volume
# -----
P <Resources> <Trips> <NULL>
P <Component Trips> <Trip Number> <1>
P <Component Trips> <Select Sensor 1 Location> <NULL>
B <1> <0.1> <-0.1>
C <104>
P <Component Trips> <Trip Number> <2>
P <Component Trips> <Select Sensor 1 Location> <NULL>
B <1> <0.1> <-0.1>
C <104>

# -----
# Fix graphs for room temperature
# -----
P <Line Graphs> <Graph Number> <3>

```

```

P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Phase Variable> <NULL>
P <Phase Variable> <Temperature> <NULL>
B <1> <0.1> <-0.1>
C <104>
B <2> <-0.046942> <-0.423747>
P <Phase Variable> <Done> <NULL>
P <Line Graphs> <Modify Curve> <NULL>
P <Modify Curve> <Curve Number> <1>
P <Modify Curve> <Remove Curve> <NULL>
P <Modify Curve> <Change to Curve #> <2>
P <Modify Curve> <Done> <NULL>

#####
# Part 6b
#####

# -----
# Include vector plots of room
# -----
P <Results> <Vector/Contour Graphs> <NULL>
P <Vector/Contour Graphs> <Graph Number> <6>
P <Vector/Contour Graphs> <Graph Type> <VECTOR>
P <Vector/Contour Graphs> <Scaling Value> <1>
P <Vector/Contour Graphs> <Plot Time> <200>
P <Vector/Contour Graphs> <Description> <NULL>
R <Flow Profiles - 1>

P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.1> <-0.05>
B <1> <0.6> <-0.25>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.3> <-0.2>
B <1> <0.1> <-0.1>
C <6>
C <185>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Velocity> <NULL>
P <Vector/Contour Variables> <Done> <NULL>

P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.1> <-0.3>
B <1> <0.6> <-0.5>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.3> <-0.4>
B <1> <0.1> <-0.1>
C <16>
C <195>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Velocity> <NULL>
P <Vector/Contour Variables> <Done> <NULL>

P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.1> <-0.55>
B <1> <0.6> <-0.75>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.3> <-0.6>
B <1> <0.1> <-0.1>
C <26>
C <205>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Velocity> <NULL>
P <Vector/Contour Variables> <Done> <NULL>

P <Tools> <Sketch> <NULL>

```

```

P <Sketch> <Rectangle> <NULL>
B <1> <0.31> <-0.21>
B <1> <0.39> <-0.25>
P <Sketch> <Rectangle> <NULL>
B <1> <0.31> <-0.46>
B <1> <0.39> <-0.5>
P <Sketch> <Rectangle> <NULL>
B <1> <0.31> <-0.71>
B <1> <0.39> <-0.75>
P <Sketch> <Centered Text> <NULL>
B <1> <0.35> <-0.24>
R <C2>
P <Sketch> <Centered Text> <NULL>
B <1> <0.35> <-0.49>
R <C1>
P <Sketch> <Centered Text> <NULL>
B <1> <0.35> <-0.74>
R <C3>
P <Sketch> <Centered Text> <NULL>
B <1> <0.55> <-0.05>
R <AC Vent>
P <Sketch> <Done> <NULL>

P <Vector/Contour Graphs> <Replace Data> <NULL>
P <Vector/Contour Graphs> <Plot Time> <100>
P <Vector/Contour Graphs> <Replace Data> <NULL>
P <Vector/Contour Graphs> <Plot Time> <200>
P <Vector/Contour Graphs> <Replace Data> <NULL>

P <Results> <Vector/Contour Graphs> <NULL>
P <Vector/Contour Graphs> <Graph Number> <7>
P <Vector/Contour Graphs> <Graph Type> <VECTOR>
P <Vector/Contour Graphs> <Scaling Value> <1>
P <Vector/Contour Graphs> <Plot Time> <200>
P <Vector/Contour Graphs> <Description> <NULL>
R <Flow Profiles - 2>

P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.1> <-0.05>
B <1> <0.6> <-0.25>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.3> <-0.2>
B <1> <0.1> <-0.1>
C <1>
C <206>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Velocity> <NULL>
P <Vector/Contour Variables> <Done> <NULL>

P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.1> <-0.3>
B <1> <0.6> <-0.5>
P <Vector/Contour Graphs> <Select Cells> <NULL>
B <1> <0.3> <-0.4>
B <1> <0.1> <-0.1>
C <3>
C <208>
P <Vector/Contour Graphs> <Select Variable> <NULL>
P <Vector/Contour Variables> <Velocity> <NULL>
P <Vector/Contour Variables> <Done> <NULL>

P <Vector/Contour Graphs> <Draw Region> <NULL>
B <1> <0.1> <-0.55>
B <1> <0.6> <-0.75>
P <Vector/Contour Graphs> <Select Cells> <NULL>

```



B <1> <0.3> <-0.6>  
 B <1> <0.1> <-0.1>  
 C <5>  
 C <210>  
 P <Vector/Contour Graphs> <Select Variable> <NULL>  
 P <Vector/Contour Variables> <Velocity> <NULL>  
 P <Vector/Contour Variables> <Done> <NULL>

P <Tools> <Sketch> <NULL>  
 P <Sketch> <Rectangle> <NULL>  
 B <1> <0.17> <-0.46>  
 B <1> <0.25> <-0.5>  
 P <Sketch> <Rectangle> <NULL>  
 B <1> <0.31> <-0.46>  
 B <1> <0.39> <-0.5>  
 P <Sketch> <Rectangle> <NULL>  
 B <1> <0.45> <-0.46>  
 B <1> <0.53> <-0.5>  
 P <Sketch> <Centered Text> <NULL>  
 B <1> <0.35> <-0.49>  
 R <C1>  
 P <Sketch> <Centered Text> <NULL>  
 B <1> <0.21> <-0.49>  
 R <C2>  
 P <Sketch> <Centered Text> <NULL>  
 B <1> <0.49> <-0.49>  
 R <C3>  
 P <Sketch> <Centered Text> <NULL>  
 B <1> <0.21> <-0.545>  
 R <AC Vent>  
 P <Sketch> <Centered Text> <NULL>  
 B <1> <0.42> <-0.28>  
 R <Return>  
 P <Sketch> <Rectangle> <NULL>  
 B <1> <0.41> <-0.21>  
 B <1> <0.44> <-0.25>  
 P <Sketch> <Done> <NULL>

P <Vector/Contour Graphs> <Replace Data> <NULL>

P <Vector/Contour Graphs> <Plot Time> <100>  
 P <Vector/Contour Graphs> <Replace Data> <NULL>  
 P <Vector/Contour Graphs> <Plot Time> <200>  
 P <Vector/Contour Graphs> <Replace Data> <NULL>

```
# -----
# Add plots of AC flow rates
# -----
P <Results> <Line Graphs> <NULL>
P <Line Graphs> <Graph Number> <8>
P <Line Graphs> <Description> <NULL>
R <AC Flows>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Flow Variable> <NULL>
P <Flow Variable> <Flow> <NULL>
B <1> <0.101525> <-0.677345>
B <1> <0.598236> <-0.676256>
B <2> <-0.344968> <-0.641398>
P <Flow Variable> <Done> <NULL>
P <Line Graphs> <Replace Data> <NULL>
```

```
# -----
# Extend run time to 10 minutes
# -----
P <Build> <Run Control> <NULL>
```

```

P <Run Control> <Time Domains> <NULL>
P <Time Domains> <End Time (sec)> <600>
P <Time Domains> <Done> <NULL>

P <Results> <Line Graphs> <NULL>
P <Line Graphs> <Graph Number> <3>
P <Line Graphs> <Graph Number> <8>

#####
# Part 7
#####

# -----
# Add Tracers
# -----
P <Build> <Tracers> <NULL>
P <Tracers> <Tracer Number> <1>
T <tracers> <R1C2> <Computer 1>
P <Tracers> <Locations and Traits> <NULL>
P <Tracer Locations and Traits> <Vapor Phase (V)> <YES>
P <Tracer Locations and Traits> <Done> <NULL>
P <Tracers> <Tracer Number> <2>
T <tracers> <R2C2> <Computer 2>
P <Tracers> <Locations and Traits> <NULL>
P <Tracer Locations and Traits> <Vapor Phase (V)> <YES>
P <Tracer Locations and Traits> <Done> <NULL>
P <Tracers> <Tracer Number> <3>
T <tracers> <R3C2> <Computer 3>
P <Tracers> <Locations and Traits> <NULL>
P <Tracer Locations and Traits> <Vapor Phase (V)> <YES>
P <Tracer Locations and Traits> <Done> <NULL>

# -----
# Define Tracer Sets
# -----
P <Tracers> <Tracer Sets> <NULL>
P <Tracer Sets> <Set Number> <1>
P <Tracer Sets> <Set Number> <2>
P <Tracer Sets> <Set Number> <3>
P <Tracer Sets> <Set Number> <4>

P <Tracer Sets> <Set Number> <1>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Element Number> <1>
P <Tracer Set Composition> <Select Tracers> <NULL>
R <1 | &v90>
P <Tracer Set Composition> <Parameter 1> <1>
P <Tracer Set Composition> <Done> <NULL>

P <Tracer Sets> <Set Number> <2>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Element Number> <1>
P <Tracer Set Composition> <Select Tracers> <NULL>
R <2 | &v92>
P <Tracer Set Composition> <Parameter 1> <1>
P <Tracer Set Composition> <Done> <NULL>

P <Tracer Sets> <Set Number> <3>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Element Number> <1>
P <Tracer Set Composition> <Select Tracers> <NULL>
R <3 | &v94>
P <Tracer Set Composition> <Parameter 1> <1>
P <Tracer Set Composition> <Done> <NULL>

```

```

P <Tracer Sets> <Set Number> <4>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Add All Vapor Phase Tracers> <NULL>
P <Tracer Set Composition> <Element Number> <1-3>
P <Tracer Set Composition> <Parameter 1> <1>
P <Tracer Set Composition> <Done> <NULL>

```

```

P <Tracer Sets> <Set Number> <1>
P <Tracer Sets> <Description> <NULL>
R <Computer 1>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Done> <NULL>
P <Tracer Sets> <Set Number> <2>
P <Tracer Sets> <Description> <NULL>
R <Computer 2>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Done> <NULL>
P <Tracer Sets> <Set Number> <3>
P <Tracer Sets> <Description> <NULL>
R <Computer 3>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Done> <NULL>
P <Tracer Sets> <Set Number> <4>
P <Tracer Sets> <Description> <NULL>
R <Filter>
P <Tracer Sets> <Set Composition> <NULL>
P <Tracer Set Composition> <Done> <NULL>
P <Tracer Sets> <Done> <NULL>

```

```

# -----
# Add Tracer Sources
# -----
P <Tracers> <Sources> <NULL>
P <Tracer Sources> <Locate Source> <NULL>
B <1> <0.28> <-0.5>
T <tracer_sources> <R1C2> <Computer 1>
P <Tracer Sources> <Locate Source> <NULL>
B <1> <0.14> <-0.5>
T <tracer_sources> <R2C2> <Computer 2>
P <Tracer Sources> <Locate Source> <NULL>
B <1> <0.45> <-0.5>
T <tracer_sources> <R3C2> <Computer 3>
P <Tracer Sources> <Edit Table> <NULL>
P <Tracer Source Parameters> <Source Number> <1>
P <Tracer Source Parameters> <Source Number> <2>
P <Tracer Source Parameters> <Source Number> <3>
P <Tracer Source Parameters> <Source Number> <1-3>
P <Tracer Source Parameters> <Phase Option> <VAPOR>
P <Tracer Source Parameters> <Source Rate> <0.1>
P <Tracer Source Parameters> <Source Number> <1>
P <Tracer Source Parameters> <Tracer Set/Fractions> <NULL>
R <1 | &v96>
P <Tracer Source Parameters> <Source Number> <2>
P <Tracer Source Parameters> <Tracer Set/Fractions> <NULL>
R <2 | &v98>
P <Tracer Source Parameters> <Source Number> <3>
P <Tracer Source Parameters> <Tracer Set/Fractions> <NULL>
R <3 | &v100>
P <Tracer Source Parameters> <Done> <NULL>
P <Tracer Sources> <Done> <NULL>

```

```

# -----
# Add Filters
# -----
P <Tracers> <Filters> <NULL>

```

```

P <Filters> <Locate Filter> <NULL>
B <1> <0.28> <-0.55>
T <filters> <R1C2> <Computer 1>
P <Filters> <Locate Filter> <NULL>
B <1> <0.14> <-0.55>
T <filters> <R2C2> <Computer 2>
P <Filters> <Locate Filter> <NULL>
B <1> <0.45> <-0.55>
T <filters> <R3C2> <Computer 3>
P <Filters> <Edit Table> <NULL>

P <Filter Parameters> <Filter Number> <1-3>
P <Filter Parameters> <Vapor Phase Tracer Set> <NULL>
R <4 ¶ &v102>
P <Filter Parameters> <Done> <NULL>
P <Filters> <Done> <NULL>

P <Build> <Control Volumes> <NULL>

# -----
# Add Plots
# -----
P <Results> <Line Graphs> <NULL>
P <Line Graphs> <Graph Number> <9>
P <Line Graphs> <Description> <NULL>
R <Computer 1>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Filter Variable> <NULL>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <1 ¶ &v90>
K <1>
B <2> <0.28> <-0.55>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <2 ¶ &v92>
K <1>
B <2> <0.28> <-0.55>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <3 ¶ &v94>
K <1>
B <2> <0.28> <-0.55>
P <Component Variable 3> <Done> <NULL>
P <Line Graphs> <Variable> <DEP.>
P <Line Graphs> <Maximum Value> <40>
P <Line Graphs> <Minimum Value> <-10>

P <Line Graphs> <Graph Number> <10>
P <Line Graphs> <Description> <NULL>
R <Computer 2>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Filter Variable> <NULL>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <1 ¶ &v90>
K <2>
B <2> <-0.454135> <-0.495428>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <2 ¶ &v92>
K <2>
B <2> <0.111350> <-0.571681>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <3 ¶ &v94>
K <2>
B <2> <0.173576> <-0.668631>
P <Component Variable 3> <Done> <NULL>
P <Line Graphs> <Variable> <DEP.>
P <Line Graphs> <Maximum Value> <40>

```

```

P <Line Graphs> <Minimum Value> <-10>

P <Line Graphs> <Graph Number> <11>
P <Line Graphs> <Description> <NULL>
R <Computer 3>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Filter Variable> <NULL>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <1 | &v90>
K <3>
B <2> <-0.385360> <-0.533554>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <2 | &v92>
K <3>
B <2> <-0.450860> <-0.531376>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <3 | &v94>
K <3>
B <2> <0.188859> <-0.680613>
P <Component Variable 3> <Done> <NULL>
P <Line Graphs> <Variable> <DEP.>
P <Line Graphs> <Maximum Value> <40>
P <Line Graphs> <Minimum Value> <-10>

P <Line Graphs> <Graph Number> <12>
P <Line Graphs> <Description> <NULL>
R <Tracers through return duct>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Tracer Migration Variable> <NULL>
P <Tracer Migration Variable> <Location> <FLOW PATH>
P <Tracer Migration Variable> <Integrated Migration> <NULL>
R <1 | &v90>
B <1> <0.101525> <-0.676256>
B <2> <-0.510902> <-0.516125>
P <Tracer Migration Variable> <Integrated Migration> <NULL>
R <2 | &v92>
B <1> <0.102617> <-0.672988>
B <2> <-0.470510> <-0.545537>
P <Tracer Migration Variable> <Integrated Migration> <NULL>
R <3 | &v94>
B <1> <0.100434> <-0.671899>
B <2> <0.016375> <-0.646844>
P <Tracer Migration Variable> <Done> <NULL>
P <Line Graphs> <Variable> <DEP.>
P <Line Graphs> <Maximum Value> <40>
P <Line Graphs> <Minimum Value> <-10>

P <Line Graphs> <Graph Number> <13>
P <Line Graphs> <Description> <NULL>
R <"Free" Tracers>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Miscellaneous Variable> <NULL>
P <Miscellaneous Variable> <Total Tracer> <NULL>
R <1 | &v90>
P <Miscellaneous Variable> <Total Tracer> <NULL>
R <2 | &v92>
P <Miscellaneous Variable> <Total Tracer> <NULL>
R <3 | &v94>
P <Miscellaneous Variable> <Done> <NULL>
P <Line Graphs> <Variable> <DEP.>
P <Line Graphs> <Maximum Value> <40>
P <Line Graphs> <Minimum Value> <-10>

P <Line Graphs> <Graph Number> <14>
P <Line Graphs> <Description> <NULL>

```

```

R <Total Tracer 1 Inventory>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Filter Variable> <NULL>
P <Component Variable 3> <Filter Retained Vapor Tracer Moles> <NULL>
R <1 |&v90>
K <1>
K <2>
K <3>
B <2> <-0.509811> <-0.821136>
P <Component Variable 3> <Done> <NULL>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Tracer Migration Variable> <NULL>
P <Tracer Migration Variable> <Integrated Migration> <NULL>
R <1 |&v90>
B <1> <0.101525> <-0.676256>
B <2> <-0.098250> <-0.515036>
P <Tracer Migration Variable> <Done> <NULL>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Miscellaneous Variable> <NULL>
P <Miscellaneous Variable> <Total Tracer> <NULL>
R <1 |&v90>
P <Miscellaneous Variable> <Done> <NULL>
P <Line Graphs> <Modify Curve> <NULL>
P <Modify Curve> <Curve Number> <1>
P <Modify Curve> <Add Curve> <2>
P <Modify Curve> <Add Curve> <3>
P <Modify Curve> <Add Curve> <4>
P <Modify Curve> <Add Curve> <5>
P <Modify Curve> <Curve Number> <2>
P <Modify Curve> <Hide Curve> <NULL>
P <Modify Curve> <Curve Number> <3>
P <Modify Curve> <Hide Curve> <NULL>
P <Modify Curve> <Curve Number> <4>
P <Modify Curve> <Hide Curve> <NULL>
P <Modify Curve> <Curve Number> <5>
P <Modify Curve> <Hide Curve> <NULL>
P <Modify Curve> <Done> <NULL>

P <Results> <Line Graphs> <NULL>
P <Line Graphs> <Graph Number> <9>
P <Line Graphs> <Graph Number> <10>
P <Line Graphs> <Graph Number> <11>
P <Line Graphs> <Graph Number> <12>
P <Line Graphs> <Graph Number> <13>
P <Line Graphs> <Graph Number> <14>

#####
# Part 8
#####

# -----
# Define Particles
# -----
P <Build> <Liquid Components> <NULL>
P <Liquid Components> <Type> <NONE>
P <Liquid Components> <Type> <SOLID PARTICLE>
P <Liquid Components> <Edit Components> <NULL>
P <SOLID PARTICLE Components - Table 1> <Component Number> <1>
T <lcomp_gen1> <R1C2> <sawdust>
P <SOLID PARTICLE Components - Table 1> <Pure Substance Density> <4>
P <SOLID PARTICLE Components - Table 1> <Specific Heat> <1>
P <SOLID PARTICLE Components - Table 1> <Suspension Characteristic Diameter> <1.969e-3>
>
P <SOLID PARTICLE Components - Table 1> <Done> <NULL>

```

```

# -----
# Define Sets
# -----
P <Liquid Components> <Define Component Sets> <NULL>
P <Liquid Component Sets> <Set Number> <1>
T <lcomp_sets> <R1C2> <Inject>
P <Liquid Component Sets> <Set Number> <2>
T <lcomp_sets> <R2C2> <Filter>
P <Liquid Component Sets> <Set Number> <1>
P <Liquid Component Sets> <Define Set Constituents> <NULL>
P <Set Constituents> <Component> <NULL>
R <1 sawdust>
P <Set Constituents> <Parameter 1> <1>
P <Set Constituents> <Done> <NULL>
P <Liquid Component Sets> <Set Number> <2>
P <Liquid Component Sets> <Define Set Constituents> <NULL>
P <Set Constituents> <Component> <NULL>
R <1 sawdust>
P <Set Constituents> <Parameter 1> <0.9>
P <Set Constituents> <Done> <NULL>
P <Liquid Component Sets> <Done> <NULL>

# -----
# Apply Set to Boundary Condition
# -----
P <Build> <Boundary Conditions> <NULL>
P <Boundary Conditions> <Edit Table 2> <NULL>
T <bc2> <R2C2> <7.803e-8>
T <bc2> <R2C9> <1>
T <bc2> <R2C6> <1.969e-3>
P <BC Parameters - Table 2> <Edit Table 4> <NULL>
P <BC Parameters - Table 4> <Select Liquid Comp. Set> <NONE>
R <1 Inject>
P <BC Parameters - Table 4> <Done> <NULL>
P <Boundary Conditions> <Done> <NULL>

# -----
# Define Plots
# -----
P <Line Graphs> <Graph Number> <15>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Miscellaneous Variable> <NULL>
P <Miscellaneous Variable> <Total SOLID PARTICLE Component Mass> <NULL>
R <1 sawdust>
P <Miscellaneous Variable> <Done> <NULL>

P <Line Graphs> <Graph Number> <16>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Drop Field Variable> <NULL>
P <Drop Field Variable> <Diameter> <NULL>
B <1> <0.139734> <-0.134862>
B <1> <0.355885> <-0.303922>
B <1> <0.368985> <-0.641612>
B <1> <0.358068> <-0.302832>
B <1> <0.370077> <-0.808279>
B <1> <0.364618> <-0.306100>
B <2> <-0.093884> <-0.871460>
P <Drop Field Variable> <Done> <NULL>

P <Line Graphs> <Graph Number> <17>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Drop Field Variable> <NULL>
P <Drop Field Variable> <Deposition> <NULL>
B <1> <0.251084> <-0.591289>
B <1> <0.372260> <-0.297386>

```

```
B <1> <0.313310> <-0.303922>
B <1> <0.135367> <-0.305011>
B <1> <0.074234> <-0.296296>
B <1> <0.239076> <-0.752723>
B <1> <0.204143> <-0.302832>
P <Drop Field Variable> <Done> <NULL>

P <Line Graphs> <Graph Number> <18>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Liquid Component Variable> <NULL>
P <Liquid Component Variable> <Cont. Liq. Solid Particle Variable> <NULL>
P <Cont. Liq. Solid Particle Variable> <Portion> <SETTLED>
P <Cont. Liq. Solid Particle Variable> <Volume Fraction> <NULL>
B <1> <0.281651> <-0.347280>
B <1> <0.228159> <-0.781046>
B <1> <0.228159> <-0.339869>
B <1> <0.222701> <-0.684096>
B <1> <0.211784> <-0.647059>
B <1> <0.207418> <-0.596950>
B <2> <-0.529461> <-0.667756>
P <Cont. Liq. Solid Particle Variable> <Done> <NULL>

P <Line Graphs> <Graph Number> <19>
P <Line Graphs> <Define Curves> <NULL>
P <Select Variables> <Liquid Component Variable> <NULL>
P <Liquid Component Variable> <Cont. Liq. Solid Particle Variable> <NULL>
P <Cont. Liq. Solid Particle Variable> <Volume Fraction> <NULL>
B <1> <0.294751> <-0.562966>
B <1> <0.353702> <-0.802832>
B <1> <0.374443> <-0.303922>
B <1> <0.323135> <-0.307190>
B <1> <0.145192> <-0.303922>
B <1> <0.087334> <-0.310458>
B <2> <0.094975> <-0.603486>
P <Cont. Liq. Solid Particle Variable> <Done> <NULL>

# -----
# Save Part 8
# -----
P <File> <Save As> <NULL>
R <pc-part8.GTH>
P <File> <Run> <NULL>
R <Yes>
R <Yes to All>
P <Results> <Replace All Graph Data> <NULL>
P <File> <Save> <NULL>
```