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<Document file="StarVMC/Geometry/TestGeo/TestGeo3.xml">
<Module name="TestGeo3" comment="Test of parameterized placement of volumes">
  <Author name="Amilkar Quintero" />
  <Created date="29/Jun/2011" />

  <!-- What is this?-->
  <CDE>
  AGECOM,GCUNIT,GCONST
  </CDE>

  <!-- Declare all volumes -->
  <Content>
  PIPE,PALU,PBER
  </Content>

  <!-- Pipe versioning information -->
  <Structure name="PIPV">
    <var type="float" name="version" />
    <var type="int" name="config" />
  </Structure>

  <!-- Pipe geometry information -->
  <Structure name="PIPG">

    <var type="float" name="version" />
    <var type="float" name="zoffset" />
    <var type="float" name="yoffset" />
    <var type="float" name="xoffset" />

    <var type="float" name="zoffber" />

    <var type="float" name="vacdens" />
    <var type="float" name="zslice(14)" />
    <var type="float" name="rmin(14)" />
    <var type="float" name="rmax(14)" />

  </Structure>

  <Export language="Morfran">
  REAL INCH/2.54/;
  </Export>

  <!-- Fill all structures _after_ declaration of structs and variables -->
  <Fill name="PIPV" comment="Pipe version" >
    <var name="version" value="1.0" comment="2.0 version of the beam pipe"/>
    <var name="config" value="1" comment="Configuration is one" />
  </Fill>

  <Fill name="PIPG" comment="Pipe geometry">
    <var name="version" value="1.0" comment="Default position and geometry" />

    <var name="vacdens" value="1.25E-8" comment="Vacuum density... needs to be verified" />

    <var name="xoffset" value="0.0" comment="Default x position " />
    <var name="yoffset" value="100.0" comment="Default y position " />
    <var name="zoffset" value="0.0" comment="Default z position " />

    <var name="zoffber" value="-15.75*2.54" comment="Offset of beryllium" />

    <var name="zslice" comment="Z slices in the pipe :: flange length is unknown ::" value="{-55.71 *
inch, -54.71 * inch, -54.71 * inch, -43.71 * inch, -43.71 * inch, -15.75 * inch, -15.75 * inch, 31.5 *
inch, 31.5 * inch, 43.72 * inch, 43.72 * inch, 54.71 * inch, 54.71 * inch, 55.71 * inch }" />

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    <var name="rmin"    comment="Minimum radius of the pipe"
        value="{0.7875 * inch, 0.7875 * inch, 0.7875 * inch, 0.7875 * inch, 0.7875 *
inch, 0.7875 * inch, 0.7875 * inch, 0.7875 * inch, 0.7875 * inch, 0.7875 * inch, 0.7875 *
inch, 0.7875 * inch, 0.7875 * inch}" />

    <var name="rmax"    comment="Maximum radius of the pipe"
        value="{0.7875 * inch + 0.5875 * inch, 0.7875 * inch + 0.5875 * inch, 0.7875 *
inch + 0.065 * inch, 0.7875 * inch + 0.065 * inch, 0.7875 * inch + 0.055 * inch, 0.7875 * inch + 0.055
* inch, 0.7875 * inch + 0.030 * inch, 0.7875 * inch + 0.030 * inch, 0.7875 * inch + 0.055 * inch, 0.7875
* inch + 0.055 * inch, 0.7875 * inch + 0.065 * inch, 0.7875 * inch + 0.065 * inch, 0.7875 * inch +
0.5875 * inch, 0.7875 * inch + 0.5875 * inch}" />

</Fill>

<!-- Create the main block and place in CAVE -->
<Create    block="PIPE" />
<Placement block="PIPE" in="CAVE" x="PIPG_xoffset" y="PIPG_yoffset" z="PIPG_zoffset" />

<Volume name="PIPE" comment="Pipe mother volume">

    <Material name = "Air" />
    <Material name = "Vacuum" dens="PIPG_vacdens" />
    <Attribute for = "PIPE" seen="0" colo="0" />

    <Shape    type = "Pcon"
        nz    = "14" phi1="0" dphi="360"
        zi    = "{-55.71 * inch, -54.71 * inch, -54.71 * inch, -43.71 * inch, -43.71 * inch, -15.75 *
inch, -15.75 * inch, 31.5 * inch, 31.5 * inch, 43.72 * inch, 43.72 * inch, 54.71 * inch, 54.71 * inch,
55.71 * inch }"
        rmn   = "{0,0,0,0,0,0,0,0,0,0,0,0,0,0}"
        rmx   = "{0.7875*inch+0.5875*inch, 0.7875*inch+0.5875*inch, 0.7875*inch+0.065 *inch,
0.7875*inch+0.065 *inch, 0.7875*inch+0.055 *inch, 0.7875*inch+0.055 *inch,0.7875*inch+0.030 *inch,
0.7875*inch+0.030 *inch, 0.7875*inch+0.055 *inch, 0.7875*inch+0.055 *inch,0.7875*inch+0.065 *inch,
0.7875*inch+0.065 *inch, 0.7875*inch+0.5875*inch, 0.7875*inch+0.5875*inch}" />

    <Create    block="PALU" />
    <Placement block="PALU" in="PIPE" />

</Volume>

<Volume name="PALU" comment="The aluminium section of the beam pipe" >

    <Material name = "Aluminium" />
    <Attribute for = "PALU" seen="1" colo="44" />

    <Shape    type = "Pcon"
        nz    = "14" phi1="0" dphi="360"
        zi    = "{-55.71*inch, -54.71*inch, -54.71*inch, -43.71*inch, -43.71*inch, -15.75*inch,
-15.75*inch, 31.5*inch, 31.5*inch, 43.72*inch, 43.72*inch, 54.71*inch, 54.71*inch, 55.71*inch }"
        rmn   = "{0.7875*inch, 0.7875*inch,0.7875*inch, 0.7875*inch, 0.7875*inch, 0.7875*inch,
0.7875*inch, 0.7875*inch, 0.7875*inch, 0.7875*inch, 0.7875*inch, 0.7875*inch, 0.7875*inch}"
        rmx   = "{0.7875*inch+0.5875*inch, 0.7875*inch+0.5875*inch, 0.7875*inch+0.065*inch,
0.7875*inch+0.065*inch, 0.7875*inch+0.055*inch, 0.7875*inch+0.055*inch, 0.7875*inch+0.030*inch, 0.7875*inch
+0.030*inch, 0.7875*inch+0.055*inch, 0.7875*inch+0.055*inch, 0.7875*inch+0.065*inch, 0.7875*inch
+0.065*inch, 0.7875*inch+0.5875*inch, 0.7875*inch+0.5875*inch}" />

    <Create block="PBER" />
    <!-- <Placement block="PBER" in="PALU" z="PIPG_zoffber" /> -->
        <Placement block="PBER" in="PALU" z="-15.75" />

</Volume>

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<Volume name="PBER" comment="The beryllium section of the beam pipe">
  <Material name="Berillium" />
  <Attribute for ="PBER" seen="1" colo="33" />

  <Shape type="TUBE" dz="47.25*2.54/2"
    rmin="PIPG_rmin(1)"
    rmax="PIPG_rmax(7)" />

  <!-- <Shape type="TUBE" dz="(PIPG_zslice(8)-PIPG_zslice(7))/2"
    rmin="PIPG_rmin(1)"
    rmax="PIPG_rmax(7)" /> -->

</Volume>

</Module>
</Document>
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