```
function model_c1_r1
%MF3.0
wd='.';  %in test
%configuration macro: prepares CFD model constants of AMR rev01 for Multiflux 2.3
%created on 4/3/01
%This file will be called from cfd_in which prepares multiflux data files

%!!!!!!!!!!!!!!!
%radiation connections are controlled by non-zero soid angles in the sa matrix
%check ecc ecd edd
%check 3-3 conduction cross section (a7+ainv?)
%kod value?
%!!!!!!!!!!!!!!!

% Definition of lines and nodes
% line 1: containers and gaps - 21 nodes;
% line 2: mixed air - 21 nodes;
% line 3 liner inside surface - 21 nodes;

LS=[3 21]; %3 lines with 21 segments

%new and old global variables V3.0
%OLD globals: LS TN T P QMAIN PBAR;
%NEW globals: FMA FMAG FMM1 FMMG1 FMM2 FMMG2  % branch air mass flux, branch moisture mass
flux for unsaturated and saturated flow

% Container number and container segment indeces (zero means no container segment) :
cind=[1 1 0;
   2 3 4;
   3 6 7;
   4 9 10;
   5 12 13;
   6 15 16;
   7 18 19;
   8 21 0];
ci=[1 3 4  6 7 9 10 12 13 15 16 18 19 21];

m1=8; n1=3;
% Air gap number and indeces between containers:
gind=[ 1       2;
   2   5;
   3   8;
   4   11;
   5   14;
   6   17;
   7   20];
m2=7;  n2=2;

%load MULTIFLUX 1.0 fcc fcd fdd solid angle matrices:
fcc=mread([wd '/cfd_d/fcc.dat']);
fdd=mread([wd '/cfd_d/fdd.dat']);
fcd=mread([wd '/cfd_d/fcd.dat']);

%and arrange fcc, fcd, fdd into MULTIFLUX 2.0 sa matrix:
sa=zeros(LS(1)*LS(2));
for i=1:m1-1
   i1=max(cind(i,2),cind(i,3));
   i2=cind(i+1,2);
   sa(i1,i2)=fcc(1,i);
end
i2=0;
for i=1:m1
   for j=2:n1
      i1=cind(i,j);
      if i1~=0
         i2=i2+1;
         for j1=1:21
            s1=fcd(i2,j1);
            if s1~=0
               %sa(i1,j1+2*LS(2))=j1; %for QA comparison with rcd indeces (pass)
               sa(i1,j1+2*LS(2))=s1;
            end
         end
      end
```

```
   end
end
for i=1:LS(2)-1
   i1=i+2*LS(2);
   i2=i1+1;
   sa(i1,i2)=fdd(1,i);
end

%input data preparation

%This file will be called from model_in which prepares multiflux data files
%input data preparation
pbconst=88720; %user-defined barometric pressure
lew=0.000634;          %Lewis number
kcon=2.02;             %conductivity of wall rock
kvap=1e-10;            %vapor permeability for generator resistance
ainv=0.0;              %invert cross section
d1=1.564;                     %WP diameter
d2=5.52;                      %inner airway diameter
ct=0.01;                      %wall rock thickness
rgvf=20;                      %RGV wall rock resistance multiplier
rho=2540;                     %rho for wall rock
cp=900;                       %cp for wall rock
keff=10;                      %container inside conduction
cpw=435.25;                   %cp for WP
rcpc=rho*cp;           %rho*cp for concrete
a1=d1*pi;                     %container circumference
a2=d1^2*pi/4;                 %container end surface
a5=d2*pi;                     %drift circumference
a6=d2^2*pi/4;                 %drift cross section
a7=((d2+2*ct)^2-d2^2)*pi/4;   %concrete liner cross section
a8=(a6-a2-ainv);                                  %open cross section
dh=4*a8/(a1+a5);                                  %drift hydraulic diameter
kod=0.025/dh;                 %relative drift surface roughness
hi=1.89;                             %inner surface heat transport coefficient
ho=1.89;                             %outter surface heat transport coefficient
%Drift section lengths:
dsl=[1.865 0.1 2.6375 2.6375 0.1 2.6525 2.6525 0.1 1.865 1.865 0.1 2.6525...
      2.6525 0.1 2.6375 2.6375 0.1 2.6525 2.6525 0.1 2.785];

%Thermal leading edge distances:
led=dsl*0+5.5+0.1+1/2*5.5; %AMR model assumption

LN=size(dsl,2);  %conversion
kconc=kcon; %conversion
e1=0.8;   %example
e2=0.95;  %example
sbc=5.669e-8;  %Stephan-Boltzman constant

cfd_in=[ LN sbc e1 e2 d1 d2 ct kconc keff ainv kod rgvf ];

%define connection to NTCF module
%ittg: index vector to relate segments (1,2,..) in NTCF to vector elements in ttg(i)
first=(LS(1)-1)*LS(2)+1;      %first element in 3rd line
iliner=first:LS(1)*LS(2);   %nodes indeces on drift surface
igap=gind(:,2:size(gind,2));

%define connection to previous and next sections
%iain: index vector to define intake air elements in ttg(i)
iain=LS(2)+1;                                 %nodes: first elemet of second line
%iaout: index vector to define outflow air elements to connect to next section iain
iaout=2*LS(2);                                %nodes: last elemet of second line

iwin=[1
   LS(2)*2+1];         %nodes: surface input prehistory index
iwout=[LS(2)   %nodes: surface output prehistory index
   LS(1)*LS(2)];

%define sources
%iheat: index vector to relate elements of qheat (1,2,...) to CFD nodes
ittg=1:21;
iheat=1:21;  %nodes of active heat source
%ivapor: index vector to relate elements of moisture network source nodes
ivapor=43:63;          %nodes of active vapor source
```

```
%!!!!!!!!!!!!!!!!!!!!!!

%additional derived radiation constants, using Holman, p. 402, Eq. (8-40)
ecc=1/(1/e1+1/e1-1);                                %container end to container end, 2-body,
fi12=1
ecd=1/(1/e1+d1/d2*(1/e2-1));     %container to drift wall, 2-body, fi12=1
edd=1/(1/e2+1/e2-1);                         %drift wall to drift wall, 2-body, fi12=1

vffa=[];  % vffa table: air flow model
vffag=[];  % vffag table: air flow model
duca=[];  % duca table: air flow model
ducag=[];  % ducag table: air flow model

% Definition of connections between nodes of lines - heat
frc=[];% frc table: free convection
foc=[];        % foc table: forced convection
moc=[];        % moc table: maximum convection
coc=[];        % coc table: controlled convection, capacitive
cod=[];% cod table: conduction
rad=[];        % rad table: radiation
duc=[];        % direct user connection -- not needed for this case; used to be hcc
vcc=[];        % differentiial CFD -- not needed for this case
% Definition of generators
frcg=[];       % frcg table: free convection
focg=[];       % focg table: forced convection
mocg=[];       % mocg table: maximum convection
cocg=[];       % cocg table: controlled convection, capacitive
codg=[];       % codg table: conduction
radg=[];       % radg table: radiation
ducg=[];       % direct user connection -- not needed for this case; used to be hcc
vccg=[];       % differentiial CFD -- not needed for this case

% Definition of connections between nodes of lines - moisture
frcm=[];       % frcm table: free convection
focm=[];       % focm table: forced convection
mocm=[];       % mocm table: maximum convection
cocm=[];       % cocm table: controlled convection, capacitive
codm=[];       % codm table: conduction
ducm=[];       % direct user connection -- not needed for this case; used to be hcc
% Definition of generators
frcmg=[]; % frcmg table: free convection
focmg=[]; % focmg table: forced convection
mocmg=[]; % mocmg table: maximum convection
cocmg=[]; % cocmg table: controlled convection, capacitive
codmg=[]; % codmg table: conduction
ducmg=[]; % direct user connection -- not needed for this case; used to be hcc

%air flow model configuration
%[c i j ai aj dhi dhj L H kod m];
for i=LS(2)+1:2*LS(2)-1
    ii=i-LS(2);
   vffa=[vffa; 900 i i+1 a8 a8 dh dh (dsl(ii)+dsl(ii+1))/2 0 kod 1];
   vffa=[vffa; 901 i i+1 a8 a8 dh dh (dsl(ii)+dsl(ii+1))/2 0 kod 1];
end
%intake air node, iain
ii=1;
vffa=[vffa; 900 iain iain a8 a8 dh dh dsl(ii) 0 kod 1];
ii=LS(2);
vffa=[vffa; 900 iaout iaout a8 a8 dh dh dsl(ii) 0 kod 1];

%air mass flow model configuration - direct mass flow distribution definition
fma=zeros(LS(1)*LS(2));  %branch and node fluxes initialized as zeros
fmag=zeros(LS(1)*LS(2),1); %generator fluxes
for i=22:41 % airline lower index: rows
    fma(i,i+1)=1;  %100% airflow in airline
end
for i=1:20 % airline lower index: rows
    fma(i,i+1)=a2/(a8+a2); %area-proportial airflow in container line for gap convective
resistance model
end
fma=fma-fma';         %negative flow in reverse directions
fmag(iain,1)=1;    %influx of air to intake nodes
fmag(iaout,1)=-1;    %efflux of air from exit nodes
```

```
fma(iain,iain)=1;   %influx is applied to node for simplifying FMA usage when transport
subfunction with (i,i) is used
fma(iaout,iaout)=-1; %same reason as before
%fma=fma*QMAIN and fmag=fmag*QMAIN will be needed to have all branch and node air mass fluxes

%1-1 (between nodes on line 1)
% frc table: free convection (within gaps)
%[c i j ai ri ro L m]
% foc table: max forced convection (within gaps)
%[cl ct i j ai ri ro L kod led m]
for i=1:m2
   for j=2:n2
      i1=gind(i,j);
      %frc=[frc; 104 (i1-1) (i1) a2 d1/2 d2/2 dsl(i1) 0.5 ];       %left to node i1 x .5
      %frcm=[frcm; 104 (i1-1) (i1) a2 d1/2 d2/2 dsl(i1) 0.5 ];     %left to node i1 x .5
      foc=[foc; 205 (i1-1) (i1) (i1-1) (i1) (i1) (i1+1) a2 d1/2 d2/2 dsl(i1) kod led(i1) 0.5
];     %left to node i1 x .5
      focm=[focm; 205 (i1-1) (i1) (i1-1) (i1) (i1) (i1+1) a2 d1/2 d2/2 dsl(i1) kod led(i1)
0.5 ];  %left to node i1 x .5
   end
   %frc=[frc; 104 (i1) (i1+1) a2 d1/2 d2/2 dsl(i1) 0.5 ];   %right to node i1 x .5
   %frcm=[frcm; 104 (i1) (i1+1) a2 d1/2 d2/2 dsl(i1) 0.5];  %right to node i1 x .5
   foc=[foc; 205 (i1) (i1+1) (i1-1) (i1) (i1) (i1+1) a2 d1/2 d2/2 dsl(i1) kod led(i1+1) 0.5
];     %right to node i1 x .5
   focm=[focm; 205 (i1) (i1+1) (i1-1) (i1) (i1) (i1+1) a2 d1/2 d2/2 dsl(i1) kod led(i1+1) 0.5
];     %right to node i1 x .5
end
% cod table: conduction
%[c i j ai ri ro L k m]
for i=1:m1
   for j=2:n1-1
      i1=cind(i,j);
      i2=cind(i,j+1);
      if i2~=0
         cod=[cod; 500 (i1) (i2) a2 d1/2 d2/2 dsl(i1) keff 1];      %between nodes i1 & i2
         %codm=[codm; 500 (i1) (i2) a2 d1/2 d2/2 dsl(i1) keff*0 1]; %moisture unconnected
      end
   end
end
% rad table: radiation
%[c i j ai e vf m]
for i=1:LS(2)
   for j=1:LS(2)
      if sa(i,j)~=0
         rad=[rad; 600 i j a2 ecc sa(i,j) 1 ];
      end
   end
end

%1-2 (between nodes on line 1 and line 2)

%frc table: user-defined heat transport coefficient
% for i=ci
%    frc=[frc; 100 i i+LS(2) a1*dsl(i) d1/2 d2/2 dh hi];
%    frcm=[frcm; 100 i i+LS(2) a1*dsl(i) d1/2 d2/2 dh hi/1.1/1000*1.117];
% end

% foc table: forced convection
n=LS(2);
for i=ci
    i2=n+i;
    if i>1 & i<n
        j1=i2-1;j2=i2;j3=i2;j4=i2+1;
    elseif i==1
        j1=i2;j2=i2+1;j3=i2;j4=i2+1;
    elseif i==n
        j1=i2-1;j2=i2;j3=i2-1;j4=i2;
    end
    foc=[foc; 202 i i+LS(2) j1 j2 j3 j4 a1*dsl(i) d1/2 d2/2 dh  kod led(i) 1 ];
    focm=[focm; 202  i i+LS(2) j1 j2 j3 j4 a1*dsl(i) d1/2 d2/2 dh  kod led(i) 1 ];
end

%2-2 (between nodes along line 2)
% controlled convection only on this line
```

```
%[c i j ai m];
for i=1:LS(2)-1
   coc=[coc; 400 i+LS(2) i+LS(2)+1 a8 1];
   cocm=[cocm; 400 i+LS(2) i+LS(2)+1 a8 1];

end

%2-3 (between nodes on line 2 and line 3)

%frc table: user-defined heat transport coefficient
% for i=1:LS(2)
%    i1=i+LS(2);
%    i2=i+2*LS(2);
%    frc=[frc; 100 i1 i2 a5*dsl(i) d1/2 d2/2 dh ho];
%    frcm=[frcm; 100 i1 i2 a5*dsl(i) d1/2 d2/2 dh ho/1.1/1000*1.117];
% end

% foc table: forced convection
n=LS(2);
for i=1:n
    i1=i+2*n;
    i2=i+n;
    if i2>n+1 & i2<2*n
        j1=i2-1;j2=i2;j3=i2;j4=i2+1;
    elseif i2==n+1
        j1=i2;j2=i2+1;j3=i2;j4=i2+1;
    elseif i2==2*n
        j1=i2-1;j2=i2;j3=i2-1;j4=i2;
    end
    foc=[foc; 202 i1 i2 j1 j2 j3 j4 a5*dsl(i) d1/2 d2/2 dh  kod led(i) 1 ];
    focm=[focm; 202 i1 i2 j1 j2 j3 j4 a5*dsl(i) d1/2 d2/2 dh  kod led(i) 1 ];
end

%3-3 (between nodes on line 3)

% cod table: conduction
%[c i j ai ri ro L k m]
for i=1:LS(2)-1
   i1=i+2*LS(2);
   i2=i1+1;
   cod=[cod; 500 i1 i2 a7+ainv d1/2 d2/2 dsl(i) kcon 1 ];
   %codm - moisture not connected
end
% rad table: radiation
for i=2*LS(2)+1:3*LS(2)
   for j=2*LS(2)+1:3*LS(2)
      if sa(i,j)~=0
         rad=[rad; 600 i j a5*dsl(i-2*LS(2)) edd sa(i,j) 1 ];
      end
   end
end

%1-3 (between nodes on line 1 and line 3)

% rad table: radiation, WP surface with end cap correction
for i=1:LS(2)
   for j=2*LS(2)+1:3*LS(2)
      if sa(i,j)~=0
         rad=[rad; 600 i j a1*dsl(i)+a2  ecd sa(i,j) 1 ];
      end
   end
end


%generators

%intake air point along line 2
% controlled convection
cocg=[cocg; 400 (LS(2)+1) (LS(2)+1) a8 1];
cocmg=[cocmg; 400 (LS(2)+1) (LS(2)+1) a8 1];

%connection across drift wall along line 3
% conduction
for i=1:LS(2)
```

```
   i1=i+2*LS(2);
   codg=[codg; 500 i1 i1 a5*dsl(i) d1/2 d2/2 ct kcon 1 ];
   codmg=[codmg; 500 i1 i1 a5*dsl(i) d1/2 d2/2 ct kvap rgvf ];
end

%save results
%new
mwrite([wd '/cfd_d/fma.dat'], fma);
mwrite([wd '/cfd_d/fmag.dat'], fmag);
mwrite([wd '/cfd_d/vffa.dat'], vffa);
mwrite([wd '/cfd_d/vffag.dat'], vffag);

mwrite([wd '/cfd_d/frc.dat'], frc);
mwrite([wd '/cfd_d/foc.dat'], foc);
mwrite([wd '/cfd_d/moc.dat'], moc);
mwrite([wd '/cfd_d/coc.dat'], coc);
mwrite([wd '/cfd_d/cod.dat'], cod);
mwrite([wd '/cfd_d/rad.dat'], rad);
mwrite([wd '/cfd_d/duc.dat'], duc);
mwrite([wd '/cfd_d/vcc.dat'], vcc);

mwrite([wd '/cfd_d/frcg.dat'], frcg);
mwrite([wd '/cfd_d/focg.dat'], focg);
mwrite([wd '/cfd_d/mocg.dat'], mocg);
mwrite([wd '/cfd_d/cocg.dat'], cocg);
mwrite([wd '/cfd_d/codg.dat'], codg);
mwrite([wd '/cfd_d/radg.dat'], radg);
mwrite([wd '/cfd_d/ducg.dat'], ducg);
mwrite([wd '/cfd_d/vccg.dat'], vccg);

mwrite([wd '/cfd_d/frcm.dat'], frcm);
mwrite([wd '/cfd_d/focm.dat'], focm);
mwrite([wd '/cfd_d/mocm.dat'], mocm);
mwrite([wd '/cfd_d/cocm.dat'], cocm);
mwrite([wd '/cfd_d/codm.dat'], codm);
mwrite([wd '/cfd_d/ducm.dat'], ducm);

mwrite([wd '/cfd_d/frcmg.dat'], frcmg);
mwrite([wd '/cfd_d/focmg.dat'], focmg);
mwrite([wd '/cfd_d/mocmg.dat'], mocmg);
mwrite([wd '/cfd_d/cocmg.dat'], cocmg);
mwrite([wd '/cfd_d/codmg.dat'], codmg);
mwrite([wd '/cfd_d/ducmg.dat'], ducmg);

mwrite([wd '/cfd_d/LS.dat'], LS);
mwrite([wd '/cfd_d/cfd_in.dat'], cfd_in);
%mwrite([wd '/cfd_d/ittg.dat'], ittg);
%mwrite([wd '/cfd_d/ippg.dat'], ippg);
mwrite([wd '/cfd_d/iain.dat'], iain);
mwrite([wd '/cfd_d/iaout.dat'], iaout);
mwrite([wd '/cfd_d/iheat.dat'], iheat);
mwrite([wd '/cfd_d/ivapor.dat'], ivapor);
mwrite([wd '/cfd_d/iliner.dat'], iliner);
% mwrite([wd '/cfd_d/iair.dat'], iair);
%mwrite([wd '/cfd_d/qmav.dat'], qmav);
mwrite([wd '/cfd_d/iwin.dat'], iwin);
mwrite([wd '/cfd_d/iwout.dat'], iwout);
```

Other MULTIFLUX common input files used in the calculation

Waste package heat load [W]: **qq.dat**

```
2.955866e+003  0.000000e+000  4.148245e+003  4.148245e+003  0.000000e+000  4.171398e+003
4.171398e+003  0.000000e+000  2.955866e+003  2.955866e+003  0.000000e+000  4.171398e+003
4.171398e+003  0.000000e+000  4.148245e+003  4.148245e+003  0.000000e+000  4.171398e+003
4.171398e+003  0.000000e+000  4.375916e+003
2.932529e+003  0.000000e+000  4.115495e+003  4.115495e+003  0.000000e+000  4.138465e+003
4.138465e+003  0.000000e+000  2.932529e+003  2.932529e+003  0.000000e+000  4.138465e+003
4.138465e+003  0.000000e+000  4.115495e+003  4.115495e+003  0.000000e+000  4.138465e+003
4.138465e+003  0.000000e+000  4.341368e+003
2.895486e+003  0.000000e+000  4.063509e+003  4.063509e+003  0.000000e+000  4.086189e+003
4.086189e+003  0.000000e+000  2.895486e+003  2.895486e+003  0.000000e+000  4.086189e+003
4.086189e+003  0.000000e+000  4.063509e+003  4.063509e+003  0.000000e+000  4.086189e+003
4.086189e+003  0.000000e+000  4.286529e+003
```

```
2.833889e+003  0.000000e+000  3.977063e+003  3.977063e+003  0.000000e+000  3.999261e+003
3.999261e+003  0.000000e+000  2.833889e+003  2.833889e+003  0.000000e+000  3.999261e+003
3.999261e+003  0.000000e+000  3.977063e+003  3.977063e+003  0.000000e+000  3.999261e+003
3.999261e+003  0.000000e+000  4.195339e+003
2.699565e+003  0.000000e+000  3.788555e+003  3.788555e+003  0.000000e+000  3.809700e+003
3.809700e+003  0.000000e+000  2.699565e+003  2.699565e+003  0.000000e+000  3.809700e+003
3.809700e+003  0.000000e+000  3.788555e+003  3.788555e+003  0.000000e+000  3.809700e+003
3.809700e+003  0.000000e+000  3.996485e+003
2.478145e+003  0.000000e+000  3.477814e+003  3.477814e+003  0.000000e+000  3.497225e+003
3.497225e+003  0.000000e+000  2.478145e+003  2.478145e+003  0.000000e+000  3.497225e+003
3.497225e+003  0.000000e+000  3.477814e+003  3.477814e+003  0.000000e+000  3.497225e+003
3.497225e+003  0.000000e+000  3.668689e+003
2.245651e+003  0.000000e+000  3.151534e+003  3.151534e+003  0.000000e+000  3.169124e+003
3.169124e+003  0.000000e+000  2.245651e+003  2.245651e+003  0.000000e+000  3.169124e+003
3.169124e+003  0.000000e+000  3.151534e+003  3.151534e+003  0.000000e+000  3.169124e+003
3.169124e+003  0.000000e+000  3.324502e+003
2.051274e+003  0.000000e+000  2.878746e+003  2.878746e+003  0.000000e+000  2.894813e+003
2.894813e+003  0.000000e+000  2.051274e+003  2.051274e+003  0.000000e+000  2.894813e+003
2.894813e+003  0.000000e+000  2.878746e+003  2.878746e+003  0.000000e+000  2.894813e+003
2.894813e+003  0.000000e+000  3.036742e+003
1.882352e+003  0.000000e+000  2.641682e+003  2.641682e+003  0.000000e+000  2.656426e+003
2.656426e+003  0.000000e+000  1.882352e+003  1.882352e+003  0.000000e+000  2.656426e+003
2.656426e+003  0.000000e+000  2.641682e+003  2.641682e+003  0.000000e+000  2.656426e+003
2.656426e+003  0.000000e+000  2.786667e+003
1.732433e+003  0.000000e+000  2.431286e+003  2.431286e+003  0.000000e+000  2.444856e+003
2.444856e+003  0.000000e+000  1.732433e+003  1.732433e+003  0.000000e+000  2.444856e+003
2.444856e+003  0.000000e+000  2.431286e+003  2.431286e+003  0.000000e+000  2.444856e+003
2.444856e+003  0.000000e+000  2.564724e+003
1.601257e+003  0.000000e+000  2.247196e+003  2.247196e+003  0.000000e+000  2.259738e+003
2.259738e+003  0.000000e+000  1.601257e+003  1.601257e+003  0.000000e+000  2.259738e+003
2.259738e+003  0.000000e+000  2.247196e+003  2.247196e+003  0.000000e+000  2.259738e+003
2.259738e+003  0.000000e+000  2.370530e+003
1.484628e+003  0.000000e+000  2.083518e+003  2.083518e+003  0.000000e+000  2.095147e+003
2.095147e+003  0.000000e+000  1.484628e+003  1.484628e+003  0.000000e+000  2.095147e+003
2.095147e+003  0.000000e+000  2.083518e+003  2.083518e+003  0.000000e+000  2.095147e+003
2.095147e+003  0.000000e+000  2.197869e+003
1.379443e+003  0.000000e+000  1.935903e+003  1.935903e+003  0.000000e+000  1.946708e+003
1.946708e+003  0.000000e+000  1.379443e+003  1.379443e+003  0.000000e+000  1.946708e+003
1.946708e+003  0.000000e+000  1.935903e+003  1.935903e+003  0.000000e+000  1.946708e+003
1.946708e+003  0.000000e+000  2.042153e+003
1.286139e+003  0.000000e+000  1.804960e+003  1.804960e+003  0.000000e+000  1.815034e+003
1.815034e+003  0.000000e+000  1.286139e+003  1.286139e+003  0.000000e+000  1.815034e+003
1.815034e+003  0.000000e+000  1.804960e+003  1.804960e+003  0.000000e+000  1.815034e+003
1.815034e+003  0.000000e+000  1.904023e+003
1.167620e+003  0.000000e+000  1.638631e+003  1.638631e+003  0.000000e+000  1.647777e+003
1.647777e+003  0.000000e+000  1.167620e+003  1.167620e+003  0.000000e+000  1.647777e+003
1.647777e+003  0.000000e+000  1.638631e+003  1.638631e+003  0.000000e+000  1.647777e+003
1.647777e+003  0.000000e+000  1.728565e+003
1.005922e+003  0.000000e+000  1.411706e+003  1.411706e+003  0.000000e+000  1.419585e+003
1.419585e+003  0.000000e+000  1.005922e+003  1.005922e+003  0.000000e+000  1.419585e+003
1.419585e+003  0.000000e+000  1.411706e+003  1.411706e+003  0.000000e+000  1.419585e+003
1.419585e+003  0.000000e+000  1.489185e+003
8.228775e+002  0.000000e+000  1.154821e+003  1.154821e+003  0.000000e+000  1.161267e+003
1.161267e+003  0.000000e+000  8.228775e+002  8.228775e+002  0.000000e+000  1.161267e+003
1.161267e+003  0.000000e+000  1.154821e+003  1.154821e+003  0.000000e+000  1.161267e+003
1.161267e+003  0.000000e+000  1.218202e+003
6.283313e+002  0.000000e+000  8.817965e+002  8.817965e+002  0.000000e+000  8.867182e+002
8.867182e+002  0.000000e+000  6.283313e+002  6.283313e+002  0.000000e+000  8.867182e+002
8.867182e+002  0.000000e+000  8.817965e+002  8.817965e+002  0.000000e+000  8.867182e+002
8.867182e+002  0.000000e+000  9.301928e+002
4.850724e+002  0.000000e+000  6.807478e+002  6.807478e+002  0.000000e+000  6.845473e+002
6.845473e+002  0.000000e+000  4.850724e+002  4.850724e+002  0.000000e+000  6.845473e+002
6.845473e+002  0.000000e+000  6.807478e+002  6.807478e+002  0.000000e+000  6.845473e+002
6.845473e+002  0.000000e+000  7.181097e+002
3.942474e+002  0.000000e+000  5.532846e+002  5.532846e+002  0.000000e+000  5.563727e+002
5.563727e+002  0.000000e+000  3.942474e+002  3.942474e+002  0.000000e+000  5.563727e+002
5.563727e+002  0.000000e+000  5.532846e+002  5.532846e+002  0.000000e+000  5.563727e+002
5.563727e+002  0.000000e+000  5.836509e+002
2.834605e+002  0.000000e+000  3.978069e+002  3.978069e+002  0.000000e+000  4.000272e+002
4.000272e+002  0.000000e+000  2.834605e+002  2.834605e+002  0.000000e+000  4.000272e+002
4.000272e+002  0.000000e+000  3.978069e+002  3.978069e+002  0.000000e+000  4.000272e+002
4.000272e+002  0.000000e+000  4.196400e+002
2.159583e+002  0.000000e+000  3.030747e+002  3.030747e+002  0.000000e+000  3.047663e+002
3.047663e+002  0.000000e+000  2.159583e+002  2.159583e+002  0.000000e+000  3.047663e+002
```

```
3.047663e+002  0.000000e+000  3.030747e+002  3.030747e+002  0.000000e+000  3.047663e+002
3.047663e+002  0.000000e+000  3.197086e+002
1.656932e+002  0.000000e+000  2.325328e+002  2.325328e+002  0.000000e+000  2.338307e+002
2.338307e+002  0.000000e+000  1.656932e+002  1.656932e+002  0.000000e+000  2.338307e+002
2.338307e+002  0.000000e+000  2.325328e+002  2.325328e+002  0.000000e+000  2.338307e+002
2.338307e+002  0.000000e+000  2.452951e+002
1.270276e+002  0.000000e+000  1.782698e+002  1.782698e+002  0.000000e+000  1.792648e+002
1.792648e+002  0.000000e+000  1.270276e+002  1.270276e+002  0.000000e+000  1.792648e+002
1.792648e+002  0.000000e+000  1.782698e+002  1.782698e+002  0.000000e+000  1.792648e+002
1.792648e+002  0.000000e+000  1.880540e+002
9.222865e+001  0.000000e+000  1.294332e+002  1.294332e+002  0.000000e+000  1.301556e+002
1.301556e+002  0.000000e+000  9.222865e+001  9.222865e+001  0.000000e+000  1.301556e+002
1.301556e+002  0.000000e+000  1.294332e+002  1.294332e+002  0.000000e+000  1.301556e+002
1.301556e+002  0.000000e+000  1.365369e+002
7.289589e+001  0.000000e+000  1.023017e+002  1.023017e+002  0.000000e+000  1.028727e+002
1.028727e+002  0.000000e+000  7.289589e+001  7.289589e+001  0.000000e+000  1.028727e+002
1.028727e+002  0.000000e+000  1.023017e+002  1.023017e+002  0.000000e+000  1.028727e+002
1.028727e+002  0.000000e+000  1.079164e+002
5.871853e+001  0.000000e+000  8.240525e+001  8.240525e+001  0.000000e+000  8.286518e+001
8.286518e+001  0.000000e+000  5.871853e+001  5.871853e+001  0.000000e+000  8.286518e+001
8.286518e+001  0.000000e+000  8.240525e+001  8.240525e+001  0.000000e+000  8.286518e+001
8.286518e+001  0.000000e+000  8.692795e+001
```

Radiation view factors

Waste package end surface to end surface view factors: **fcc.dat**

```
8.895063e-001  8.895063e-001  8.895063e-001  8.895063e-001  8.895063e-001  8.895063e-001
8.895063e-001
```

Waste package surface to drift surface view fators: **fcd.dat**

```
4.706246e-001  2.049954e-002  2.151462e-001  2.226195e-002  2.950061e-004  4.094670e-003
1.268595e-003  2.795714e-005  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
7.670813e-002  1.806208e-003  5.797955e-001  1.842636e-001  1.659911e-003  1.829522e-002
3.672743e-003  6.859815e-005  8.888819e-004  4.601896e-004  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
9.101680e-003  2.801198e-004  1.842636e-001  5.797955e-001  1.631362e-002  1.698470e-001
1.809604e-002  2.455302e-004  2.843276e-003  1.209003e-003  4.292719e-005  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
1.960465e-003  7.180614e-005  1.799371e-002  1.667740e-001  1.776358e-003  5.815391e-001
1.837349e-001  1.632815e-003  1.550900e-002  4.575823e-003  1.386781e-004  2.094396e-003
7.557123e-004  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
6.664459e-004  2.674198e-005  3.624560e-003  1.779825e-002  2.744338e-004  1.837349e-001
5.815391e-001  1.624493e-002  1.514786e-001  2.899088e-002  6.601614e-004  8.217913e-003
2.094396e-003  4.283119e-005  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  1.614937e-005  1.709783e-003  6.081125e-003  1.156363e-004  4.123234e-002
3.821184e-001  4.541407e-003  4.706246e-001  2.096206e-001  4.134914e-003  4.123234e-002
6.507974e-003  1.103715e-004  1.709783e-003  6.508044e-004  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  8.438569e-004  2.384957e-003  5.228663e-005  1.046817e-002
8.226925e-002  9.312395e-004  2.096206e-001  4.706246e-001  2.049954e-002  2.154407e-001
2.205771e-002  2.899071e-004  4.020987e-003  1.257065e-003  2.795714e-005  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  1.827230e-005  2.094396e-003
8.217913e-003  1.457354e-004  1.550900e-002  7.534583e-002  1.776358e-003  5.815391e-001
1.837349e-001  1.632815e-003  1.799371e-002  3.651973e-003  6.885967e-005  1.121241e-003
4.618752e-004  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  7.557123e-004
2.094396e-003  4.616406e-005  2.984398e-003  8.891212e-003  2.744338e-004  1.837349e-001
5.815391e-001  1.624493e-002  1.688865e-001  1.819176e-002  2.489728e-004  3.510114e-003
1.121241e-003  2.504389e-005  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  1.838987e-005  8.888819e-004  1.951989e-003  7.153018e-005  1.829522e-002
1.719916e-001  1.806208e-003  5.797955e-001  1.842636e-001  1.659911e-003  1.829522e-002
3.672743e-003  6.859815e-005  1.150391e-003
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  3.605492e-004  6.678943e-004  2.679669e-005  3.700573e-003
```

```
1.849706e-002  2.801198e-004  1.842636e-001  5.797955e-001  1.631362e-002  1.698470e-001
1.809604e-002  2.455302e-004  3.553908e-003
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  1.176538e-005  1.121241e-003
3.510114e-003  7.180614e-005  1.799371e-002  1.667740e-001  1.776358e-003  5.815391e-001
1.837349e-001  1.632815e-003  1.835301e-002
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  4.618752e-004
1.121241e-003  2.674198e-005  3.624560e-003  1.779825e-002  2.744338e-004  1.837349e-001
5.815391e-001  1.624493e-002  1.710874e-001
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000  0.000000e+000
0.000000e+000  1.118379e-005  1.031583e-003  3.131337e-003  6.567919e-005  1.589273e-002
1.456234e-001  1.536355e-003  5.964187e-001
```

Drift surface to drift surface view factors: **fdd.dat**

```
6.810726e-003  1.589631e-001  1.022830e-001  6.027039e-003  1.594892e-001  1.023485e-001
6.012789e-003  1.270200e-001  9.404101e-002  6.810726e-003  1.594892e-001  1.023485e-001
6.012789e-003  1.589631e-001  1.022830e-001  6.027039e-003  1.594892e-001  1.023485e-001
6.012789e-003  1.639964e-001
```

Intake air temperature [°C]: **tair.dat**

```
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
  2.5000000e+001
```

Intake air vapor pressure [Pa]: **pair.dat**

```
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
```

```
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002
  9.5062540e+002

Intake air mass flow rate [kg/s]: qmain.dat

1.542887e+001
1.542887e+001
1.542887e+001
1.542887e+001
1.542887e+001
1.542887e+001
1.542887e+001
1.542887e+001
1.542887e+001
1.135569e+001
1.116201e+001
1.095507e+001
1.075150e+001
1.055740e+001
1.028803e+001
9.882898e+000
9.349448e+000
8.656296e+000
8.029192e+000
7.534276e+000
1.016305e-001
1.078363e-001
1.195015e-001
1.198879e-001
1.188620e-001
1.234371e-001
1.201402e-001
```